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THE twelfth annual convention of the American Railway Engineering & Maintenance of Way Association, which will be held in Chicago on March 21-23, will bring together the prominent engineers of the railway systems of the United States, Canada, and Mexico, and the interest shown indicates that the attendance this year will exceed that of any previous convention. Among the reports to be considered which merit special attention are important and lengthy studies of the steel rail problem and of the effect of impact on bridges, with special reference to the effect of moving loads on these structures. Both embody the results of extensive investigations and are examples of the highly valuable work of the committees of the association. No one realizes this value more than the railway companies themselves; and the association has practically their unanimous support. In order that its effective work may continue and grow along its present lines, it is often necessary for the various committees to

collect data derived from the actual results of operation of the individual railways. The responses to requests for this material often have not been satisfactory. While there may be some data which a road may have good reason for not giving out, resulting, perhaps, from the use of some special operating device or method developed on that one road, there is not much that cannot properly be given to the association, especially in view of the fact that, as it is its practice to refer to the different roads furnishing data by some letter or symbol, rather than by name, when this is desired, the source of information is not necessarily disclosed. For these reasons it would seem that the railways often should more freely and fully furnish information requested by the committees. So long as railways sometimes withhold important data because of the fear of publicity, or, perhaps, because of the cost of compiling it, so long will the association be seriously hindered in accomplishing the full measure of work it has laid out for itself. When the various members of the committees, all busy men, devote their time gratuitously to its service, the item of cost in furnishing data should not be considered by the railway. In such an organization problems common to all the roads can be worked out for the benefit of all at the cost of but a single investigation. The sooner the full support of all the railways is secured the earlier will the American Railway Engineering and Maintenance of Way association be able to attain the full measure of its ambitions and possibilities, and the greater will be the resulting benefit to all the railways.

WHILE the unit system of organization as developed by Major Hine is in use on the Sunset lines of the Southern Pacific, as well as on the Union Pacific, the Oregon Short Line and the Oregon-Washington Railroad & Navigation, a modification of the Hine system has been in effect for over six months on the lines west of El Paso. The officers themselves speak of it as the "consolidated" organization. As on the other Harriman lines, the superintendent has authority over all branches of the service on his division and reports to a general superintendent. He has an assistant superintendent, who is a first-class operating man, entirely capable of taking the superintendent's place whenever the superintendent may be absent. The positions of master mechanic and division engineer, as well as their titles, are retained; but the idea of consolidation is to get them all, with their clerks, into one common office which connects with the superintendent's private office. There is one common office file for operating, engineering and mechanical correspondence, and there is one superintendent's chief clerk, over whose desk all of the correspondence of the consolidated office passes. The division engineer and the master mechanic each have their own bureau, which handles exclusively engineering or mechanical matters; but by having one chief clerk the undoubted advantages that the Hine system has, of doing away with an enormous unnecessary correspondence between different departments of the same division, is retained. Those who have tried the system and are strongly in favor of it claim that certain disadvantages of the Hine system are done away with; and certainly the system has strong points in its favor. The advantages of having always in the office, an operating man rather than an assistant superintendent who may be a mechanical man or a division engineer, are claimed to be great. The advantages of retaining the title of master mechanic and giving him duties that have to do with the mechanical department almost entirely are worth considering. The same is true of the division engineer. The objection that another man, the assistant superintendent, is added to the division organization applies also we understand to the Hine system. We believe that the Hine system does not specifically call for an extra officer. It has been the general experience on the Harriman lines that this addition to the force becomes necessary. The forces are brought together through frequent meetings in the superintendent's office. Of course, just how close a relationship is established between the superintendent and his various subordinates, and between the subordinates themselves, depends

largely on the personality of the superintendent. On one division of the Southern Pacific it is a regular custom after dinner to have the heads of departments in the superintendent's office, when he is there, for a discussion; not a formal conference but really a chat about how things are going. The different departments are made to feel at liberty to make criticisms and suggestions in regard to each other's work, and to tell their own problems as well as point to their own achievements. By having an assistant superintendent who is really the office man, the superintendent is enabled to spend a great part of his time out on the division. He spends at least 20 days out of each month on the line, and because of the high class of men who are being selected as assistant superintendents he feels free to turn over the routine work of the division to his assistant and devote himself to any special problem that presents itself. For instance he can go out and camp beside some water station, that he thinks is being run economically and make a thorough study of it. He can perform one of the most important duties of an executive: he can drop work and think. This, on a long, busy division, is enough justification for an additional man in the organization.

THE Indiana legislature has finally given the railway commission complete authority to require the use of the block system throughout the state, on both steam and electric railways, and with no limitation as to the earnings of the roads. The new law is highly commendable in spirit, but slovenly in its language. It goes into effect January 1, 1912, and makes it unlawful after that date to run any train or car on any railway, unless such railway has in operation an automatic block system, or other system approved by the railway commission . . . unless the time therefor be extended by the commission. Power is conferred on the commission to extend when it shall be made to appear that reasonable necessity for such an extension shall exist. Power is conferred also to relieve a carrier from the obligation of the law, if the volume of traffic is such that "the same can be despatched without substantial hazard to life and property"; also to permit, in place of the automatic, either a controlled manual or a manual block, or a "despatcher's block," or any other form of block or other signal . . . if it shall be made to appear that such other form shall reasonably conserve the safety of life and property. The penalty for a violation of the law is \$1,000 a week, applicable to any person, firm, corporation, receiver, or lessee. The use of "automatic" as the initial word in the most important clause indicates a well-meaning preference for the best; but in view of the violent difference between the cost of block signals, which are really automatic (and satisfactorily effective) and the resources of the poorer roads, this phrase, implying that the commissioners ought to try to have automatics introduced everywhere, is hardly the one one might expect. One is inclined to think that the word has been used in mere carelessness or ignorance, as it has been used in the past by the national convention of railway commissioners. What is meant by "despatcher's block" is also a puzzle. In most of the reports that we have seen where this mongrel term has been used in discussion the speakers referred to the ordinary train-order system; that is to say, to roads having no space-interval system whatever. Possibly, however, our friends in the Indiana legislature refer to the tripartite manual block system, which is in use on the Erie Railroad in that state. On that section of the Erie the despatcher directs all of the movements of the block signal men. As that system has made a very good record on the Erie for over 20 years, it is well that the law should recognize it, of course; but "manual block system" would sufficiently describe it in the statute. The clause of the new law giving the commission power to postpone the date for compliance will give the members of the board a great heap of trouble, without apparent compensating advantage. The added financial burden imposed by the introduction of the block system cannot be made anything but a burden in the beginning, at least, and there is no use in trying to disguise it. It might

have been better for the legislature itself to set a later date (requiring compliance this year on a part of each company's line) rather than impose on the commission the difficult task of adjudicating the varying financial pleas of different companies. The discretion which the commission is charged to exercise as to what kind of block system each particular road ought to have, also means perplexity. If the commission is able to see that each road has *some means* which will effectively maintain a space interval between trains, it will be doing all that ought to be expected of it.

RAILWAY DEVELOPMENT IN CANADA AND THE WESTERN UNITED STATES.

IT is well known that railway construction is taking place much faster in proportion in Canada than in the United States, or even than in the less developed parts of this country. In a recently published supplement to the London *Statist* dealing with American railways, there are some comments on the extent to which railway development in Canada is being stimulated by the example of the prosperity of the Canadian Pacific which ought to contain a lesson for the people and the railway regulating authorities of the United States. The *Statist* says, in part:

Everyone is aware, of course, that the development of the Northwest was originally brought about by the enterprise of the men who built the Canadian Pacific; but the existing direct and indirect influence of the Canadian Pacific in causing the western district of Canada to be rapidly opened up to population is not so generally recognized. The Canadian Pacific itself has in recent years built and opened up a great amount of new mileage in Manitoba, Saskatchewan and Alberta. . . . But the advantage to Canada of the Canadian Pacific is much greater than the provision of this great system. . . . Undoubtedly the success of the Canadian Pacific has done more than anything else to impress investors with the advantages of Canada as a field for investment and has induced them to find capital both for the construction for the great amount of new mileage built by the Canadian Pacific and of the vast amount of mileage that has been and is being constructed by the Grand Trunk Pacific and the Canadian Northern. The development of Canada was retarded for many years by the unprofitability of the Grand Trunk Pacific, but the prosperity of the Canadian Pacific has entirely removed the ill-effects of the disappointing results of previous investments.

Many persons would say that the chief incentives to new construction of the new lines in Canada have been the large subsidies that the Canadian government has granted. These subsidies have helped. But they alone would not have induced much investment. A government subsidy reduces the amount of private capital which must originally be put into the enterprise. A guarantee, such as has been given in some cases by the Canadian government, of a limited return on a limited part of the private capital invested reduces the risk that the private investors take. But the intelligent capitalist knows that in the long run he must rely on the net earnings of the property for an adequate return. Canada thus far has allowed the owners of the Canadian Pacific to enjoy the fruits of the remarkable courage and enterprise that they showed in building the road, of the skill used in locating it and of the great ability that has been exercised in managing it. It is apt to be said further that the Canadian Pacific's increasing prosperity has been due to the rapid development of the country. But this is only part of the truth. The rapid development of the country has also been due to the enterprising policy of the Canadian Pacific. Furthermore, if its management had not efficiently handled the business that came to it the road's profits would not have risen as they have. As the *Statist* points out, the average revenue trainload increased from 229 tons in 1901 to 340.25 tons in 1910, or 49 per cent. These figures illustrate a marked increase in efficiency of operation. The railways of Canada have experienced advances in the wages of labor and the costs of materials similar to those in the United States; and there, as here, without increase in the efficiency of management the growth of traffic would not have been sufficient alone to cause anything like the increase in net earnings that has taken place. Even with an increase of 137 per cent. in the density of its freight traffic in ten years, the Canadian Pacific pays from earnings from operation dividends of only 7 per cent., the other 3 per cent. of the dividends declared this year being derived from sales of land, outside investments, etc.

It is interesting to note the extent to which differences in the attitudes of regulating authorities toward investment in railways

affect the attitudes of investors, as illustrated by the cases of the Union Pacific and the Canadian Pacific. Both roads now pay 10 per cent., 6 per cent. of the dividends of the Union Pacific being derived from earnings from operation and 4 per cent. from outside investments. The capitalization of the Union Pacific is much larger per mile than that of the Canadian Pacific, but, on the other hand, it operates through a much more highly developed territory, and in consequence both its gross and net earnings per mile are much larger. On the whole, therefore, but for one thing, investors probably would regard Union Pacific stock as highly as they do Canadian Pacific. This one thing is that while the Canadian government seems disposed to permit the owners of the Canadian Pacific to continue to enjoy the fruits of judicious investment and wise management, the Union Pacific is under attack in a suit to dissolve its combination with the Southern Pacific and practically dissolve its combination with the Southern Pacific, and practically all of its rates are the subject of litigation in the so-called intermountain cases. Consequently, while Canadian Pacific common sells for 213, Union Pacific common sells for only 171.

The territory in Canada which is not provided with railway facilities is much larger than in the United States, but there are large areas in this country which need railways as much as does any part of Canada. The line of the Chicago, Milwaukee & Puget Sound for some distance in Montana follows closely that of the Northern Pacific, and nowhere are they more distant from each other than fifty miles. North of them there is a territory in this state bounded by the Milwaukee and the Great Northern which is three-fourths the size of the state of Illinois, and which has not a mile of railway. Illinois has 11,834 miles of railway, being in point of mileage second among the states, Texas being first. There are equally large sections in Texas without railway facilities; and in some of the older states, such as Missouri, and even in some of the Eastern states, notably Maine, there are large areas without them.

There is no tariff on capital; no reciprocity arrangement is necessary to enable it to pass from the United States into Canada, and already a large amount of American capital has found investment in Canadian railways. If the Canadian government continues to follow its present liberal policy in dealing with railways, and government regulation in the United States continues to become more restrictive, it is hard to see how it can be doubted that transportation development on the other side of the border will continue to be faster than on this side. Railway development means the development of the country. As there is no tariff on capital, so there is none on men; and the main thing that is attracting thousands of immigrants from the United States to Canada annually is the opportunity which is being afforded by the rapid increase of railway mileage in western Canada, for acquiring lands cheaply and rapidly getting well fixed by its cultivation and increase in value. It is passing strange that the people of the western part of the United States do not see the significance of these facts. They indicate as plainly as anything can be that it is to their interest to encourage, as Canada is doing, the construction of new railways and the improvement of the existing lines by leaving them free to manage their affairs without interference and to earn as large profits in proportion as other concerns, as long as they give good service at reasonable rates. But they are not doing so. The average number of miles of railway in the United States per hundred square miles of territory is eight; the number of miles of line per hundred square miles in the state of Montana is 2.85, and yet at the present session of the Montana legislature there have been introduced 78 bills for the regulation of railways, an average of 13 $\frac{1}{4}$ for each working day of the session. If all or even a considerable part of them were passed they would put restrictions and burdens on the railways in that state which would greatly retard both the improvement of the existing roads and the construction of new ones. If all the rate reductions which are seriously sought in the West were made, the earnings of the railways in that territory would be so reduced, and the confidence of capitalists in

the safety of investment in them so seriously impaired, that the development of the whole territory would be seriously retarded for years.

If the people of the western part of the United States desired that capital should seek investment on the north side of the national boundary line rather than on the south side, they could not adopt a policy better adapted to producing this result than that of continuing to attack and harass capital invested in railways and other corporations. On the other hand, if the leaders of public opinion and politics in Canada continue to be wise, they will recognize the fact that they cannot in any way better promote the development of their great areas which are yet untouched by the plow of the farmer or the pick of the miner than by continuing to let the capital invested in railways alone so long as the roads give good service at rates which are reasonable in view of the conditions under which the service is rendered.

PENNSYLVANIA RAILROAD.

ONCE again the Pennsylvania directors suggest that they may have plans for large improvements which will cost many millions of dollars, and which, like the New York passenger station, cannot be expected to earn a sum anywhere near commensurate with their cost. The Pennsylvania has continuously to make large expenditures for new facilities to keep its property up to the pressing demands of new business; but this source of expenditure, such as, for instance, the proposed fifth and sixth track between Morrisville and Trenton, make directly for more economical operation and quicker handling of business, with consequent greater earnings, both gross and net.

In his annual report for the calendar year ended December 31, 1910, President McCrea says: "The Broad street station and approaches have previously been gradually improved and enlarged, but with a consequent increase in the number of passenger trains, which, based on track capacity, is not exceeded in any other large terminal in this country, it is evident that further extensions and improvements to accommodate properly the passenger traffic in and out of Philadelphia must be undertaken on a larger scale."

The preparation of plans for this work in Philadelphia has been put in the hands of a board of engineers, who are to submit their findings to an advisory board consisting of the executive, engineering and operating officers. How great the expenditures on the Philadelphia terminal will have to be the officers themselves, of course, do not know, but the New York Central's experience in rebuilding the Grand Central station shows to what extent it may be necessary to enlarge a terminal which only a comparatively few years ago was considered amply large enough for any increase in business that the company might fairly be expected to get.

In 1910 the Pennsylvania Railroad—that is, the five grand divisions directly operated east of Buffalo—carried 20,280,000,000 tons one mile and 1,694,000,000 passengers one mile. This is an increase of slightly over 6 per cent. in ton mileage, and is the largest ton mileage of any year with the exception of 1907, when the road carried 21,473,000,000 ton miles. Passenger business was 9.42 per cent. more than in 1909, and was the largest in the history of the company.

Gross earnings kept pace with the increase in business. Total operating revenues were \$160,500,000 in 1910, or \$10,900,000 more than in 1909. The average receipts per ton per mile were 5.83 mills in 1910, or .03 of a mill less than in 1909; and the average receipts per passenger per mile were 1.959 cents in 1910, or .05 of a mill less than in 1909.

Since the determination of the rate advances cases by the Interstate Commerce Commission, and the elaborate statement of theories of railroading held by the commission, it becomes more than ever necessary to examine a road's accounts to make sure that the company has spent sufficiently large sums, as well as to see what economies have been effected. In this regard the Pennsylvania Railroad may fairly be said to be the most notable example of conservatism and far-sightedness among all the rail-

ways of the United States. On any basis of comparison that we know of, the Pennsylvania's maintenance charges have been high and their expenditures for additions and betterments paid for out of income have been very great. With the change in the form of accounting prescribed by the Interstate Commerce Commission, it became necessary for the Pennsylvania Railroad to change somewhat the language in which it informed its stock-holders that it was building up their property out of earnings, as well as adding to it through the issue of new securities; but it is a change in form only. The policy and the principles which have made the Pennsylvania what it is today are being adhered to as religiously as ever before.

In 1910 the company spent \$21,800,000 for construction, equipment and real estate on the main line between New York and Pittsburgh, of which \$7,500,000 was charged to capital account, \$6,900,000 against net income, and \$1,000,000 against the extraordinary expenditure fund, created out of net income, set aside in 1909. President McCrea says: "These two latter expenditures, aggregating \$7,900,000 were necessary to maintain the earning capacity and the value of the railway facilities, and in effect offset depreciation and obsolescence." In addition the company set aside out of the 1910 net income \$3,700,000 as a reserve for additions and betterments. Further than this, in 1910 the company wrote off and debited to profit and loss \$12,400,000 from the amount applied toward the construction of the New York tunnel extension, and also wrote off \$12,995,000 as amount applied in the reduction of cost of securities and adjustment of other accounts.

In 1910 total operating expenses amounted to \$114,800,000, an increase of \$12,600,000 over 1909. After the payment of taxes, the company had operating income amounting to \$37,960,000, which is less by \$3,700,000 than the operating income in 1909. There was an increase, however, in income from sources other than operation, and a considerable decrease in fixed charges, due to the retirement of funded debt, both of which will be commented on more fully below. Net corporate income amounted to \$37,800,000 in 1910, an increase of \$2,800,000 over 1909.

Transportation expenses increased out of proportion to the increased cost in maintenance. The increase itself was due to the higher wages paid during the last four months of the year and to the larger business handled. In 1910 transportation cost \$57,200,000, an increase of \$7,800,000. Maintenance of way and structures cost \$20,300,000, an increase of \$1,500,000; and maintenance of equipment cost \$31,100,000, an increase of \$2,700,000.

The details of operating expenses show clearly the effects of the increase in wages, and also apparently show an increase in the salary of men not belonging to the brotherhoods. What we mean is illustrated by the fact that superintendence, under maintenance of way, cost \$1,024,000 in 1910, an increase of \$96,000 over 1909; superintendence under maintenance of equipment cost \$1,077,000, an increase of \$129,000; superintendence under traffic cost \$223,000 for the passenger department and \$372,000 for the freight department, a total increase of \$42,120; and superintendence under transportation was \$2,047,000, an increase of about \$300,000.

On the basis of comparison for units of maintenance, the Pennsylvania spends very large sums.

The following table shows the unit costs of maintenance:

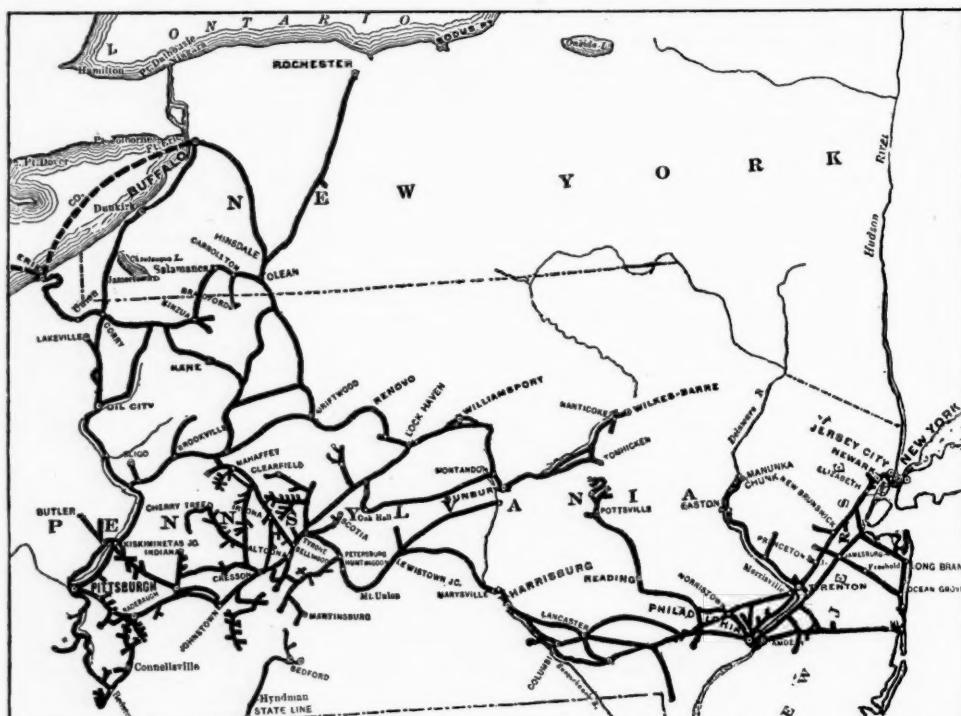
*Maintenance of way and structures.....	1910.	1909.
†Repairs per locomotive	\$2,625	\$2,462
Repairs per passenger-train car.....	3,015	2,693
Repairs per freight-train car	908	—
Repairs per freight-car	113	116

*Per mile of first, second, third, etc., track, two miles of sidings being taken equal to one mile of main track.

[†]Repairs only, no account being taken of renewals, depreciation or overhead charges.

While the

While the ton mileage increased 6.14 per cent., freight train mileage increased 7.32 per cent. The average train load was 649 tons, a decrease of 7.27 tons. On the other hand, the average number of loaded cars in a train was 24.20, which is a decrease of but 0.18 cars; while the average number of empty cars in a train was 12.36, a decrease of 0.94 cars. The average haul was 156.17 miles, a decrease of 2.51 miles. It will be seen that the slightly smaller train load is not accounted for by a larger empty car movement, and it is not accounted for by a larger proportion of high-grade freight. Every class of commodity under products of mines showed a larger tonnage in 1910 than in 1909, and the heavier and lower grade products under manufactures also showed a larger tonnage last year than



Pennsylvania Railroad.

the year before, while the tonnage of dressed meats, poultry and game, etc., and also the tonnage of lighter articles was less in 1910 than in 1909. Last year, of the total 129,900,000 tons carried on the Pennsylvania Railroad, 85,600,000 tons, or 66 per cent., of the total was products of mines, about half of these products of mines being furnished by bituminous coal.

The Pennsylvania has continued its experiments with the dynamometer car and with tonnage tests, especially over the Middle division. It may be recalled that the Pennsylvania began making these tests something over two years ago, and the very large increase in train load in 1909 over 1908 was ascribed in part to use made of the information furnished by these tests. The decrease in train load in 1910 is but 1.1 per cent., and the fact that the company did not show an increased train load last year may be due to a great number of small causes, among which might be mentioned the severe weather in January and February, and experiments which the company made with various classes of locomotives in an attempt to furnish faster freight service.

The Pennsylvania Railroad's finances are on such a vast scale that only by the liberal use of cyphers is it possible to discuss them. Last year \$82,500,000 was raised by the sale of stock at par, and

from the proceeds of this sale \$60,000,000 short term notes, which matured March 15, 1910, were redeemed and \$20,000,000 general mortgage bonds, which matured July 1, 1910, were paid off. This accounts for the considerable decrease in fixed charges previously mentioned; but it must be remembered that money to pay off these bonds and notes was raised by the sale of stock on which the company is paying 6 per cent. dividends, and on an investment of stock like the Pennsylvania, adequate dividends amount to what one might call a morally fixed charge. There is now \$22,000,000 stock authorized but unissued, in addition to the stock reserved to be exchanged for outstanding convertible bonds. The directors have asked the stockholders for authority to increase the authorized amount of capital stock by \$100,000,000, to be issued as the directors see fit. The present needs of the company will require about \$40,000,000, and the directors expect to raise this sum by the issue of a 10 per cent. allotment at par, which would amount to about \$41,000,000, of which \$22,000,000 would be provided by the stock at present authorized. When, therefore, the new \$100,000,000 stock is authorized, there will remain available for future issue about \$80,000,000.

During the year the Pennsylvania bought considerable blocks of both Norfolk & Western stock and New York, New Haven & Hartford stock. In 1909 the Pennsylvania Railroad Company owned \$1,000,000 New Haven stock and \$23,000,000 Norfolk & Western common, in addition to \$5,500,000 adjustment preferred. During 1910 the company added \$2,500,000 New Haven stock to its holdings, making a total of \$3,500,000, and added \$8,660,000 Norfolk & Western common, a total of \$31,660,000 common out of the \$68,975,000 total outstanding Norfolk & Western common.

The balance sheet of December 31, 1910, is in the form prescribed by the Interstate Commerce Commission, and the 1909 balance sheet has been recast to make comparisons possible between these two years. Total working assets amounted to \$70,970,000 at the end of 1910, of which \$32,400,000 is cash. This is a decrease in the cash held of \$75,400,000 from 1909. Total working liabilities amounted to \$34,200,000 at the end of 1910. This is more by somewhat over \$4,000,000 than working liabilities in 1909, and is mainly due to an increase of \$3,900,000 in loans and bills payable, the total in 1910 being \$3,950,000. The table below shows the results of operations in 1910 as compared with 1909:

	1910.	1909.
*Average mileage operated.....	4,045	4,015
Freight revenue	\$117,434,920	\$109,759,101
Passenger revenue	32,687,423	29,996,558
Total operating revenue.....	160,457,298	149,593,833
Maint. of way and structures..	20,342,489	19,800,162
Maint. of equipment.....	31,117,989	28,390,615
Traffic	2,221,803	1,969,093
Transportation	57,200,886	49,423,716
Total operating expenses.....	114,812,628	102,190,430
Taxes	6,374,736	4,767,029
Operating income	37,960,546	39,637,697
Gross corporate income.....	53,241,503	53,403,538
Net corporate income.....	37,775,484	35,022,088
Equipment trust certificates.....	3,418,658	3,597,710
Extraordinary expenditures	3,504,597	9,581,810
Dividends	24,410,860	19,173,743
Reserved for additions and betterments	3,700,000	2,000,000
Surplus to profit and loss.....	2,432,847	450,400

*The accounts given for 1909 are not the same as were given in last year's report, because this year the Buffalo & Allegheny Valley, which was operated separately in 1909, is included in the operations of the Pennsylvania Railroad and the accounts have been readjusted in 1909 to make comparisons accurate.

†This is after the payment of certain charges for the purchase of securities, and in 1909 for sums credited to sinking funds. See also remarks in regard to profit and loss account.

NEW BOOKS.

The Pittsburgh Transportation Problem., Report to the Mayor of Pittsburgh by Bion J. Arnold, consulting engineer.

This is a book of 202 pages, 6 in. x 9 in., with 21 maps and diagrams on sheets 9 in. x 12 in. Mr. Arnold has made a very thorough study of the immediate and future needs of the surface street railways in Pittsburgh and vicinity, and this book embodies his conclusions. Seventeen pages are taken up with a review of the development in public utility control, with special reference to street railways; a valuable condensed history of what has been done the last dozen years in Chicago, Cleveland, Philadelphia and other cities.

Letters to the Editor.

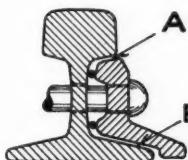
LOOSE JOINTS IN TRACK.

February 24, 1911.

To THE EDITOR OF THE RAILWAY AGE GAZETTE:

The track foreman, like a doctor, must make a correct diagnosis before he can apply the proper remedy. He is often much perplexed to locate the cause of a rough spot, especially if it is at a joint; and it usually is.

The illustration here given shows how a cause of difficulty may creep in and, because the source of the trouble cannot be seen, go undetected for sometime:



It is commonly known that splice bars are designed to take up whatever wear develops at A and B. This is done by drawing the splice bars closer together periodically by tightening the bolts. This wedging effect at the ends of the rails keeps the joints solid. When the splices have been drawn to the web of the rail they are worn out and new ones are substituted. The cut shows that bond wires behind the splices may prevent the drawing of the splice bars to the rail, and any wear at A or B will result in lost motion. This lost motion will cause the splice plates to wear very fast and the trackman will scratch his head searching for a cause of that loose joint. Even though the wires are carefully put in just over or just below the bolts, the expansion of the rails will cause the wire to "blow" and get in position to cause the trouble. Bond wires are generally applied outside the splice bars; but the facts suggested illustrate a cause of trouble which was somewhat common in the days when this method of applying bond wires was common, and which may account for some rough spots in tracks where this method is still followed. W. M. P.

TELEPHONE LINES IN FOGS.

February 6, 1911.

To THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read the article which appeared in the *Railway Age Gazette* of January 13, entitled "A Despatcher Who Does Not Like the Telephone," and I think that the writer should have told us more about his neighbors' experience. How many other despatchers agree with him? Our experience with the telephone shows that operators answer with more promptness than they did with the telegraph. The telephone bell can be heard farther than the telegraph, and agents whose work often calls them outside the office consequently answer the telephone when they would not hear the telegraph.

The objection made "that everybody butts in on the telephone" is, of course, an exaggeration; this fault is not due to imperfection of the telephone, but to the method of operation. It is entirely within the power of the management to make the telephone as exclusive as the telegraph, and prevent its use by anyone but the despatchers and operators, if thought best to do so. The company for which I work has thought best not to confine it exclusively to the use of the despatchers and operators; telephones have been installed in section houses at different points and also in foreman's car, so that these men can get information from the despatcher as to the movement of trains. This is unquestionably of great convenience to the maintenance of way department, but if it is carried to too great an extent, the company must understand that it consumes time; and if business is heavy, additional help will be required in the despatchers' office, or this feature of the work must be cut out.

We do not find that "everybody butts in on the line"; those who use the telephone besides operators are foremen, signal maintainers, and trainmen asking for information as to trains. We find the telephone superior to the telegraph in the following ways: Absolute freedom from fog trouble, whereas the tele-

graph wires are often useless for hours at a time, on account of heavy fogs from the ocean; the labor and time consumed in raising operators is practically cut out; greater speed with equal safety; much better for getting information at first hand from train and enginemen, also foremen, and others who are not operators; less friction between the despatchers and operators, as well as trainmen, with whom they do business.

ONE WHO HAS HAD A YEAR'S EXPERIENCE.

MISCELLANEOUS ANNOYANCES.

NEW YORK, Dec. 20, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have traveled a considerable mileage, but never on the —, and on my last journey home I decided to try it. The results of this trip may be of interest to those who have followed what you have written regarding courtesy and good service.

I arrived at the Union Station, famous for the incivility of its employees, at 10:05 a. m. to take a train starting at 10:30. The first unpleasant incident that awaited me was trouble with the baggage express company, which it would take too much space to explain here, but which lost that company one patron and his family for good.

After taking my family through the gate I asked the Pullman conductor, who was standing between the observation car and the adjoining sleeper where car No. 2 was, to which he replied "two cars ahead"; but I found that the car next to which he was standing was car No. 2, according to the letter on its head end. I then returned to straighten out the baggage question, and after paying what the expressman demanded, in excess of a prearranged price, which had been prepaid, was allowed to have our small baggage which was to go in the drawing room and stateroom. There were several heavy pieces (as we were moving to New York for good), and the next five minutes were spent searching the station for someone resembling a porter to help me. Finally I found a man on the sidewalk ("express transfer" on his cap), who helped me load the baggage. So far the service was woefully in contrast to that at the other company's station.

The plush seats in our rooms were filthy and could not have been *really* cleaned or beaten in a long time. At night I "turned in" early, intending to use the much advertised feature of the new cars—lights in the upper berths—but found that neither of them would light; therefore I started to go to sleep. I was about accomplishing that feat when a noise like thunder woke me up. I realized we were in the — station. An engine was next to us, under the shed, with a heavy drag of cars, working very hard, and making enough noise to wake the dead. (On the road where I work all noise next to sleepers at night is carefully avoided.)

Next morning I started for breakfast and reached the diner after squeezing my way past the Pullman conductor—the same one that I had encountered the previous forenoon—sprawled across the aisle, sitting on a berth arm and talking to the porter. With much pomp a waiter, after being told by the head waiter, spread a clean napkin in front of me over the dirty table cloth, and about two seconds later spilled the greater part of the contents of the cream pitcher over it, right under my nose. He made no attempt to clean it up, so I finally mopped it up myself.

There was a defective triple valve on our car which went into emergency every time, a few seconds after the brakes were applied, giving one's neck a successful jerk by no means pleasant or necessary. All of the above incidents are trivial by themselves, and mostly all are the fault of the Pullman Company, but nevertheless they are not what the traveling public has a right to expect on a supposedly high class train, on which extra fares are paid. I am employed by one of the best railways in this country and am a strong supporter of the railways, but this gave me an excellent chance to see matters from the public's point of view, and made me realize that seemingly small things, if there be enough of them, can make a trip unpleasant. A SUBSCRIBER.

EFFECT OF UNDULATING GRADES ON TRAIN VELOCITY.

BY F. S. FOOTE, JR.

Many writers on railway location have assumed, like the late A. M. Wellington, that a line of undulating grades, where all the rise and fall is similar to that in Fig. 1, requiring neither the use of brakes nor the shutting off of steam, may be operated as a virtually level line, the velocity being allowed to vary from a maximum at the bottom of each sag to a minimum at each summit. This view would be exactly correct if the train resistance and draw bar pull could be maintained constant at the velocity changes. To the contrary, however, we know that train resistance increases as the speed increases. Also with a nearly constant power output by the engine (i. e. throttle and reversing lever unchanged, as assumed in this case), the engine exerting full power throughout, the draw bar pull exerted will decrease as the speed increases, since the steam making capacity of the boiler is limited. From these facts it would appear that a train passing through a sag, ABC, Fig. 1, acquiring comparatively high velocity, would have delivered to it by the engine less work (force \times distance) than if the grade had been uniform between points A and C, and in the case of the sag more of the work actually delivered by the locomotive would be used in overcoming train resistance on account of the higher resistance due to higher velocity. If this is true, then the train should arrive at C with a velocity less than it would have had, had it run over a uniform grade from A to C. As an example, consider the following problem:

Let s = Space passed over in feet

a = Acceleration in feet per second per second

v = Velocity in feet per second

f = Force (drawbar pull) in pounds

g = Acceleration due to gravity

w = Weight in pounds

V = Velocity in miles per hour

5,280

$v = \frac{5,280}{3,600} V$

W = Weight in tons

$w = 2,000 W$

$$\text{By the law of falling bodies, } h = \frac{v^2}{2g}$$

$$\text{Similarly, } s = \frac{v^2}{2a}$$

$$a = \frac{v^2}{2s}$$

But, force = mass \times acceleration

$$f = \frac{w}{g} a$$

$$a = \frac{f g}{w}$$

Equating values of (a),

$$\frac{v^2}{2s} = \frac{f g}{w}$$

$$f = \frac{v^2 w}{2g s}$$

$$f = \left\{ \frac{5,280}{3,600} V \right\}^2 2,000 W \left\{ \frac{1}{2g s} \right\}$$

$$= \frac{66.9 V^2 W}{s}$$

If the force f is to accelerate the load from velocity V_1 to velocity V_2 ,

$$f = \frac{66.9 (V_2^2 - V_1^2) W}{s}$$

If W = one ton, f being expressed in pounds per ton,

$$f = \frac{66.9 (V_2^2 - V_1^2)}{s}$$

Making an average allowance for the work necessary to accelerate the rotation of the wheels, in the case of a freight train,

$$f = \frac{70 (V_2^2 - V_1^2)}{s}$$

$$s = \frac{70 (V_2^2 - V_1^2)}{f}$$

If $V_2 = V_1 + 1$

$$s = \frac{70 (2V_1 + 1)}{f}$$

Assume a consolidation locomotive of the following dimensions:

Total weight	232,500 lbs.
Weight on drivers	207,000 lbs.
Weight on trucks	25,500 lbs.
Loaded tender	149,600 lbs.
Diameter of drivers	63 in.
Cylinder, diameter and stroke	23 in. x 32 in.
Boiler pressure	200 lbs.
Total heating surface	3,705 sq. ft.
Coefficient of friction	1 4.5

The tractive effort of this engine is limited:

1. By adhesion to $207,000 \times \frac{1}{4.5} = 46,000$ lbs.
2. By cylinder power to approximately $\frac{0.85 P d^2 s}{D} = 45,677$ lbs.

Where P = Boiler steam pressure
 d = Cylinder diameter
 s = Stroke
 D = Driver diameter

3. By boiler capacity. Using a slightly modified form of the formula developed and published by Professor Goss:

$$T = 161 \frac{H}{V} - 3.8 \frac{d^2 s}{D} - w \left(2 + \frac{1}{4} V\right) - 0.11 V^2$$

In which

H = Heating surface of boiler
 V = Velocity in miles per hour
 d = Cylinder diameter
 s = Stroke
 D = Driver diameter
 w = Weight on truck and tender wheels, in tons.

Substituting the values of this problem:

TABLE I.

V.	T.	V.	T.
10	58,224	23	24,178
11	52,778	24	23,071
12	47,234	25	22,048
13	44,386	26	21,104
14	41,085	27	20,226
15	38,218	28	19,410
16	35,706	29	18,645
17	33,488	30	17,931
18	31,514	31	17,261
19	29,743	32	16,631
20	28,142	33	16,038
21	26,701	34	15,477
22	25,384	35	14,946

Our conclusion as to the change of tractive effort with changes of speed, with this particular engine, would be that below 13 miles per hour the pull is limited by the cylinder power to 45,677 lbs., and at 13 miles an hour and above, it is limited by the steam making capacity of the boilers to the figures shown in the table. On a minus 1 per cent. grade the draw bar pull

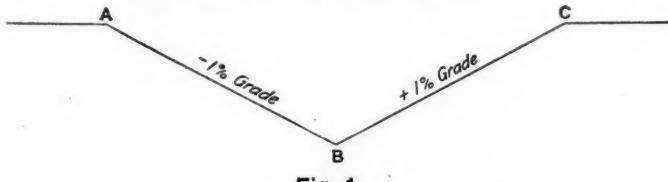


Fig. 1.

would be increased by an amount equal to 1 per cent. of the total weight of the engine and tender, or decreased by the same amount on a plus 1 per cent. grade. Assume the engine loaded to its full capacity for a speed of 20 m. p. h. on a level tangent.

Referring to the experimental results of the University of Illinois train resistance tests for cars averaging 45 tons in weight (Table II) we have five pounds per ton as the train resistance. The draw bar pull (Table I) is 28,142 lbs. We have then a train of $28,142 \frac{5}{5} = 5,628$ tons behind the tender, a very heavy train.

Let us consider our train as concentrated at its center of gravity and as entering the grade all at once. This involves some error, especially with a long train and such a comparatively short sag as this one proves to be, the center of gravity of the train not descending to the bottom of the sag, but it seems to be the only feasible method of solving the problem. Let us solve for the length of down grade AB necessary to accelerate the train from the velocity of 20 m. p. h., with which it approaches A on the level track, to 30 m. p. h., the locomotive working full power throughout. Dividing the tractive effort of the engine at various speeds by the above value

of the train load we have the tractive effort in pounds per ton for each speed on level track. Dividing 1 per cent. of the weight of the engine in pounds by the train load in tons, we get in this case 0.7 lbs., the quantity by which the tractive effort in pounds per ton will be increased on a minus 1 per cent. grade and decreased on a plus 1 per cent. grade.

TABLE III.
Tractive effort in pounds per ton.

Speed.	On level.	On	
		-1 per cent. grade.	+1 per cent. grade.
20	5.0	5.7	4.3
21	4.7	5.4	4.0
22	4.5	5.2	3.8
23	4.3	5.0	3.6
24	4.1	4.8	3.4
25	3.9	4.6	3.2
26	3.8	4.5	3.1
27	3.6	4.3	2.9
28	3.4	4.1	2.7
29	3.3	4.0	2.6
30	3.2	3.9	2.5

W

Now apply our formula, $s = 70 - (2 V_1 + 1)$, letting $W = f$

1, and f = tractive effort available for acceleration in pounds per ton for a speed which is the average of (V_2) and (V_1) miles per hour; f being (on a down grade) the quantity from Table III, column 3, plus the accelerating force due to grade, minus the train resistance in pounds per ton, this giving us the force available for acceleration.

On minus 1 per cent. grade:

$$S(20-21) = \frac{70(40+1)}{20+5.55-5.05} = \frac{70 \times 41}{20.5} = 140$$

$$S(21-22) = \frac{70 \times 43}{20+5.3-5.15} = \frac{70 \times 43}{20.15} = 149$$

$$S(22-23) = \frac{70 \times 45}{20+5.1-5.25} = \frac{70 \times 45}{19.85} = 159$$

$$S(23-24) = \frac{70 \times 47}{20+4.9-5.35} = \frac{70 \times 47}{19.55} = 168$$

$$S(24-25) = \frac{70 \times 49}{20+4.7-5.45} = \frac{70 \times 49}{19.25} = 178$$

$$S(25-26) = \frac{70 \times 51}{20+4.55-5.55} = \frac{70 \times 51}{19.0} = 188$$

$$S(26-27) = \frac{70 \times 53}{20+4.4-5.65} = \frac{70 \times 53}{18.75} = 198$$

$$S(27-28) = \frac{70 \times 55}{20+4.2-5.75} = \frac{70 \times 55}{18.45} = 209$$

$$S(28-29) = \frac{70 \times 57}{20+4.05-5.85} = \frac{70 \times 57}{18.20} = 219$$

$$S(29-30) = \frac{70 \times 59}{20+3.95-5.95} = \frac{70 \times 59}{18.00} = 229$$

1,837

On plus 1 per cent. grade:

$$S(30-29) = \frac{-70 \times 59}{2.55-5.95-20} = \frac{70 \times 59}{23.4} = 177$$

$$S(29-28) = \frac{-70 \times 57}{2.65-5.85-20} = \frac{70 \times 57}{23.2} = 172$$

$$S(28-27) = \frac{-70 \times 55}{2.8-5.75-20} = \frac{70 \times 55}{22.95} = 168$$

$$S(27-26) = \frac{-70 \times 53}{3.0-5.65-20} = \frac{70 \times 53}{22.65} = 164$$

$$S(26-25) = \frac{-70 \times 51}{3.15-5.55-20} = \frac{70 \times 51}{22.4} = 159$$

$$S(25-24) = \frac{-70 \times 49}{3.3-5.45-20} = \frac{70 \times 49}{22.15} = 155$$

$$S(24-23) = \frac{-70 \times 47}{3.5-5.35-20} = \frac{70 \times 47}{21.85} = 151$$

$$S(23-22) = \frac{-70 \times 45}{3.7-5.25-20} = \frac{70 \times 45}{21.55} = 146$$

$$S(22-21) = \frac{-70 \times 43}{3.9-5.15-20} = \frac{70 \times 43}{21.25} = 142$$

$$S(21-20) = \frac{-70 \times 41}{4.15-5.05-20} = \frac{70 \times 41}{20.9} = 137$$

1,571

The vertical drop from A to B is then 18.37 ft., and the rise from B to C is 15.71, a loss of velocity head of 2.66 ft., which is

the price we pay for the higher average speed from A to C, and this loss is greater with a deeper sag. It appears that although we may, by proper changes of velocity, very greatly reduce the grades on the virtual profile when the track profile shows an undulating grade line, it is not proper to consider that virtual profile as an unbroken horizontal line.

TIES PURCHASED IN 1909.*

The total number of wooden cross-ties purchased by the steam and electric railways of the United States in 1909 was 123,751,000. This represents an increase of 11,285,000 ties, or 10 per cent., over the number purchased in 1908, but a decrease of 29,952,000, or 19.5 per cent., from the number reported for 1907. Nearly 16,437,000 ties, or 13.3 per cent. of the total number, were reported as purchased for new track in 1909, whereas in 1908 only 7,431,000 ties, or 6.6 per cent. of the total purchased, were for this use. Of the ties bought for new track in 1909, the steam railways reported 13,822,000, or about 84 per cent., and the electric roads 2,615,000. The ties purchased for new track by steam roads formed 12 per cent. of all ties purchased by them, while the corresponding proportion for the electric roads was 31.4 per cent. More than 63 per cent. of all ties purchased were made from some species of oak or from the Southern yellow pines. The following table shows—

Cross-ties purchased in 1909, classified according to method by which made and kind of wood.

Kind of Wood.	Total.	Hewed.	Sawed.
Total	123,751,000	95,499,000	28,252,000
Oak	57,132,000	48,009,000	9,123,000
Southern pine	21,385,000	17,452,000	3,933,000
Douglas fir	9,067,000	1,952,000	7,115,000
Western pine	6,797,000	4,466,000	2,331,000
Cedar	6,777,000	4,964,000	1,813,000
Chestnut	6,629,000	5,026,000	1,603,000
Cypress	4,589,000	3,994,000	595,000
Tamarack	3,311,000	2,981,000	330,000
Hemlock	2,642,000	2,215,000	427,000
Redwood	2,088,000	1,770,000	318,000
White pine	556,000	179,000	377,000
Lodgepole pine	487,000	459,000	28,000
Gum	378,000	332,000	46,000
Spruce	225,000	155,000	70,000
Beech	195,000	163,000	32,000
All other	1,493,000	1,382,000	111,000

The two leading timbers were the same as in 1908. Oak, with an increase of 9,022,000 ties, contributed a slightly higher proportion of the total number of ties purchased in 1909 than in 1908. Southern pine, on the other hand, furnished a slightly smaller number of ties than in 1908 and a smaller proportion of the total. The increasing use of relatively unimportant tie woods, especially gum, spruce, and beech, is noteworthy. The number of gum ties purchased, which in 1907 was only 15,000, increased to 262,000 in 1908, and reached a total of 378,000 ties in 1909. Spruce and beech also showed heavy gains during the past two years. The increasing use of these species which are lacking in decay-resisting qualities is evidence of the growing use of methods of wood preservation through chemical treatment.

Approximately 77 per cent. of all ties purchased in 1909 were hewed. Although the proportion of hewed ties was lower than in 1908, it was the same as in 1907 and higher than in 1906. In the case of cedar ties the number of hewed ties shows a steady and heavy decrease since 1907, while the number of sawed ties has increased correspondingly. The steam roads purchased 115,432,000 cross-ties in 1909, or 93.3 per cent. of the total quantity purchased. Of these, 77.9 per cent. were hewed and 22.1 per cent. sawed. The electric roads purchased 8,319,000 ties, or 6.7 per cent. of the total in 1909, a gain of 1,894,000 ties over 1908. Of these, 67.5 per cent. were hewed and 32.5 per cent. sawed. Next to oak ties the electric roads purchased more ties made of chestnut than of any other species. The less durable woods are little used by the electric roads, doubtless because these roads lack facilities for preservative treatment. The total cost of all cross-ties purchased in 1909 was \$60,320,700. The

table below shows the average cost of ties purchased by steam and electric roads in 1909, 1908 and 1907:

Kind of Wood.	Average Cost.		
	Total	1909. \$0.49	1908. \$0.50
Oak	0.51	0.51	0.53
Southern pine	0.52	0.54	0.54
Douglas fir	0.41	0.45	0.47
Western pine	0.53	0.51	0.50
Cedar	0.46	0.49	0.50
Chestnut	0.44	0.49	0.48
Cypress	0.41	0.44	0.46
Tamarack	0.41	0.50	0.49
Hemlock	0.33	0.38	0.34
Redwood	0.53	0.51	0.59
White pine	0.43	0.47	0.41
Lodgepole pine	0.46	0.48	0.50
Gum	0.52	0.45	0.23
Spruce	0.49	0.47	0.39
Beech	0.36	0.44	0.40
All other	0.45	0.38	0.44

It appears that in the case of each of the leading kinds of tie timbers, except western pine, the average price was less in 1909 than in 1907, though the prices paid for chestnut, tamarack and hemlock were greater in 1908 than in 1907. Western pine ties showed an average cost of 53 cents in 1909, as compared with 51 cents in 1908 and 50 cents in 1907. Sawed ties of this timber were purchased for less in 1909 than in 1908 or 1907; but there was a remarkable increase in the cost of the hewed ties, due probably to the inclusion in the reports of large numbers of ties which had been treated with a preservative before purchase.

In 1909 the steam roads and electric roads each paid the same average price for hewed ties. Sawed ties were purchased for the same average price (49 cents) as hewed ties by the steam roads, but the electric roads paid 4 cents more for sawed ties. Although the average tie used by the electric roads is smaller than that used by the steam roads, the price paid for it is generally greater. This is due not only to the disadvantages incident to contracts for smaller quantities of material, but also to the fact that the electric roads are more likely to purchase ties at points where the price includes railroad transportation charges.

The highest average price reported by the steam railways was 64 cents for sawed redwood ties and the lowest 33 cents for hewed hemlock. The electric roads paid as high as 82 cents for hewed Western pine ties, these being practically all treated, while the lowest average price paid by them was 31 cents for hewed hemlock.

Of the 78 species of timber which the different specifications of the steam railways of the United States permit to be used as cross-ties, over one-half are acceptable for such use only after the application of a preservative. Among the woods most commonly treated are pine, red or black oak, Douglas fir, hemlock, gum, spruce and beech. The remarkable increase in the use of Western pine, gum, spruce and beech cross-ties, apparent in the reported purchases of ties in 1909, is doubtless due to the use of wood preservatives.

The following table shows the number of ties reported as purchased already treated or as treated after purchase:

Class of railway purchasing.	Total treated.	Treated before purchase.	Treated after purchase.
All railways.....	22,033,000	7,663,000	14,370,000
Steam railways.....	21,198,000	7,081,000	14,117,000
Electric railways.....	835,000	582,000	253,000
1908.			
All railways.....	23,776,000	10,973,000	12,803,000
Steam railways.....	23,157,000	10,566,000	12,591,000
Electric railways.....	619,000	407,000	212,000
1907.			
All railways.....	19,856,000	8,389,000	11,467,000
Steam railways.....	19,192,000	7,975,000	11,217,000
Electric railways.....	664,000	414,000	250,000

There are now more than 70 wood-preserving plants in the United States. A number of the large steam roads possess expensive plants fitted to handle large quantities of timber in a very efficient manner. The principal preservatives used were

*Census Bulletin; Forest Products, No. 8.



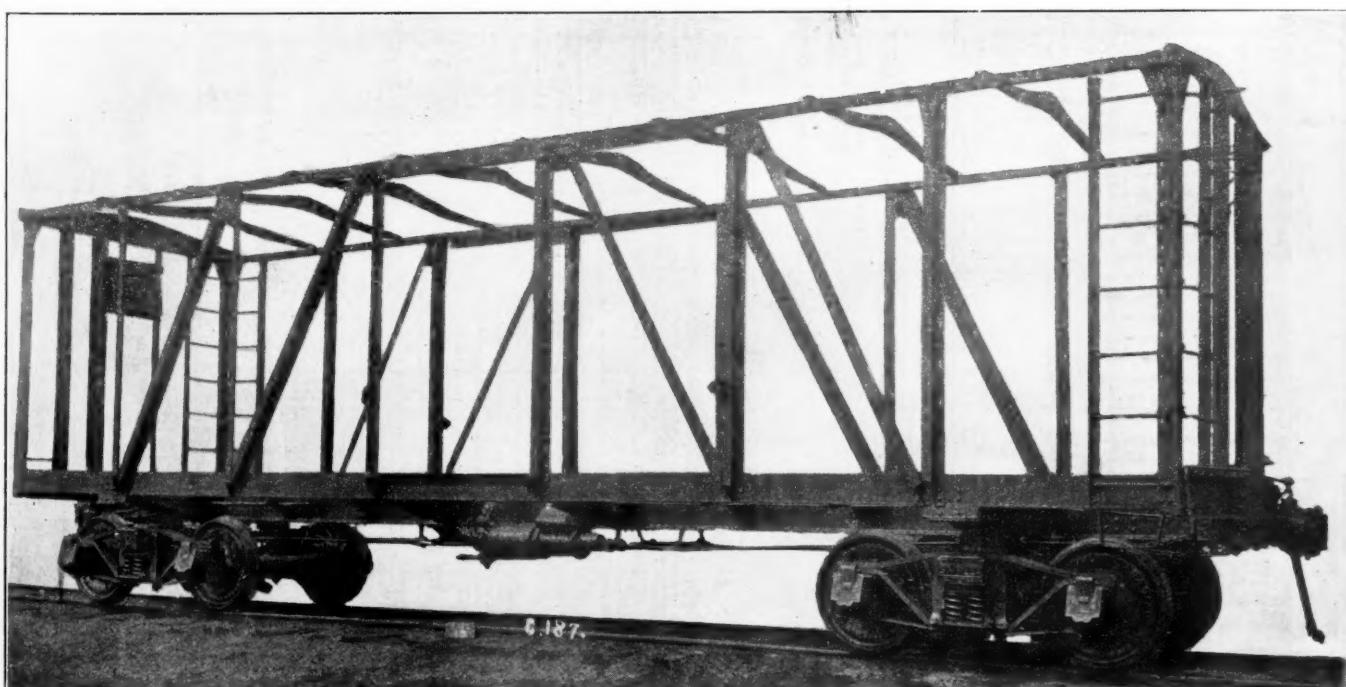
Steel Frame Box Car; Canadian Pacific.

creosote oil, and, to an almost equal degree, a solution of zinc chloride.

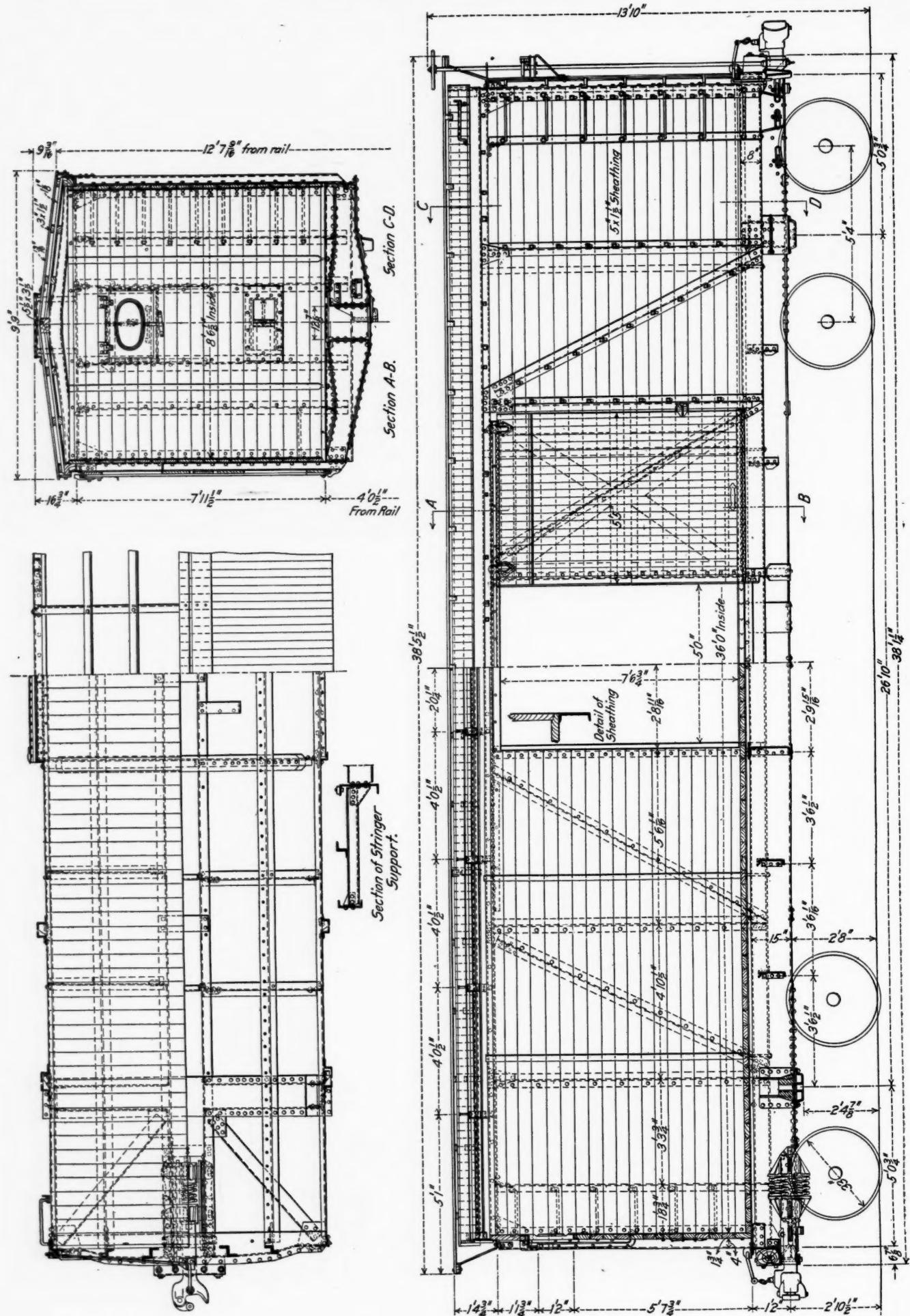
Many of the ties are treated with an emulsion of creosote oil and a solution of zinc chloride, and one road treated large quantities of its ties with a heavy injection of crude petroleum. Other preservatives are also used. The electric railways own but a few cylinder-treating plants, and these companies are generally obliged to purchase treated ties or to use some less expensive method of treatment, such as dipping the ties in a bath of the preservative. Many different preservatives are used in this manner.

STEEL FRAME BOX CARS; CANADIAN PACIFIC.

About three years ago the Dominion Car & Foundry Company built 500 box cars for the Canadian Pacific, in which the framing was of steel throughout. These cars were so satisfactory that 2,000 additional ones of the same design were ordered and placed in service, and these have been followed with an order for 2,000 more, which has recently been given the Canadian Car & Foundry Company for early spring delivery. The cars are of unusual appearance, the framing being entirely outside the lining. They are of 80,000 lbs. capacity, 36 ft. inside length, 8 ft. 8 in.



Steel Frame of Canadian Pacific Box Car.

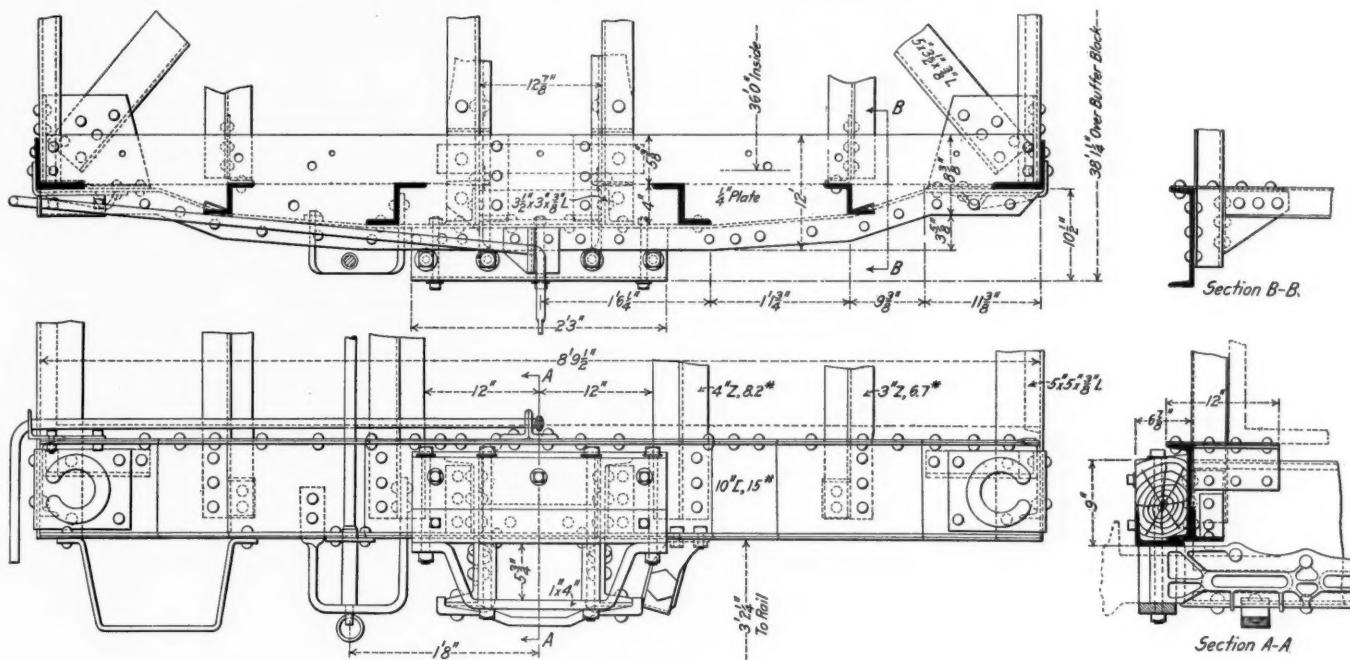


inside width, and weigh light about 36,900 lbs. The floor, side sheathing and roof are the only parts made of wood.

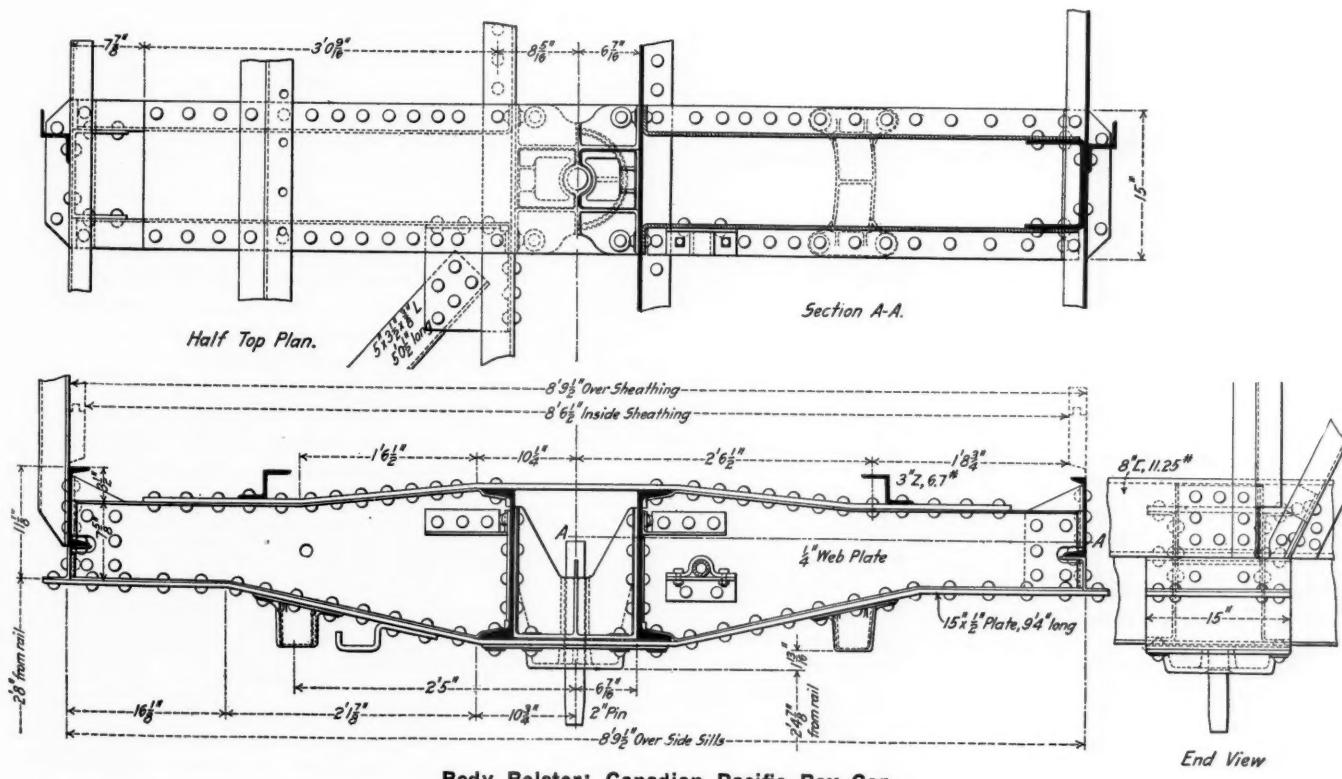
The two 14 in. channels set 12½ in. apart and continuing from end sill to end sill form the center sills. The side sills are 8 in. channels and are set with their top faces 1½ in. above the level of the top flange of the center sills. The other longitudinal sills are 3 in. Z bars located midway between the sides and center sills and resting on top of the body bolsters and cross bearers. The floor is bolted to the 3-in. Z bar stringers, using one bolt through each board; this is the only fastening between the floor and the underframe of the car. The body bolsters are pressed steel diaphragms built up with ½-in. cover plates, top and bottom. The bolsters extend below and beyond the side sills which are connected to them by angles and corner brackets. Near the

center of the underframe, just below the door posts, are two built up cross bearers composed of pressed steel diaphragms with 6 in. x ½ in. cover and bottom plates, neither of which extend all the way to the side sill connection. Both the body bolsters and the cross bearers are constructed to permit the intermediate sills, 3 in. in depth, to rest on them.

The end sills are 10 in. channels pressed to permit the Z bar end posts being secured back of them. Between the bolsters and the cross bearers are two cross braces consisting of channels secured between the side and center sills. There is also a diagonal brace from the corner of the car to the connection between the center sills and the bolster. The side framing is composed of 3-in. standard Z bars secured outside the side sills and to an angle-iron plate; the top connections are reinforced with gusset



End Sill Construction; Canadian Pacific Box Car.



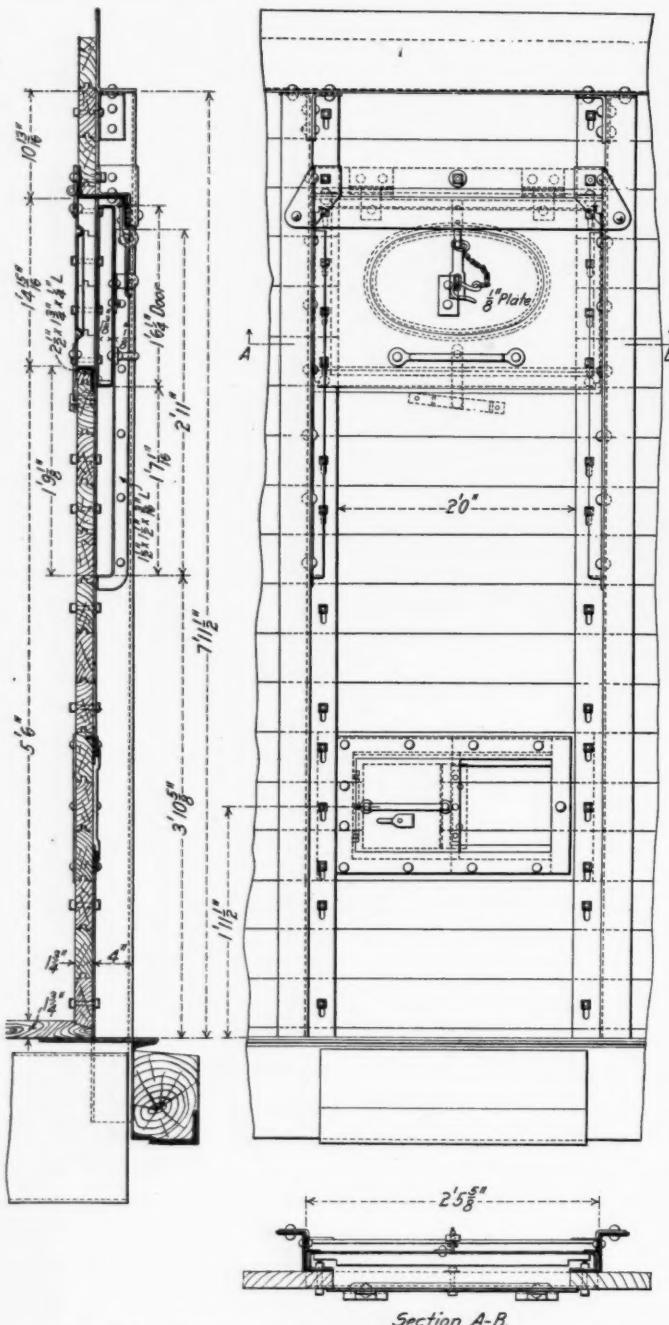
Body Bolster; Canadian Pacific Box Car.

plates. The corner posts are 5 in. x 5 in. angles and the two center end posts are 4 in. Z bars, the intermediate end posts being 3 in. Z bars. These are secured to the steel end carlins, which are of Z section. The other carlins are of pressed steel U section; they are arranged to lip over the side plate and are secured by a rivet through the vertical flange of the plate.

The inside lining or sheathing for the sides and ends is 1½ in. x 5 in. pine, tongued and grooved, bolted to the Z bar members

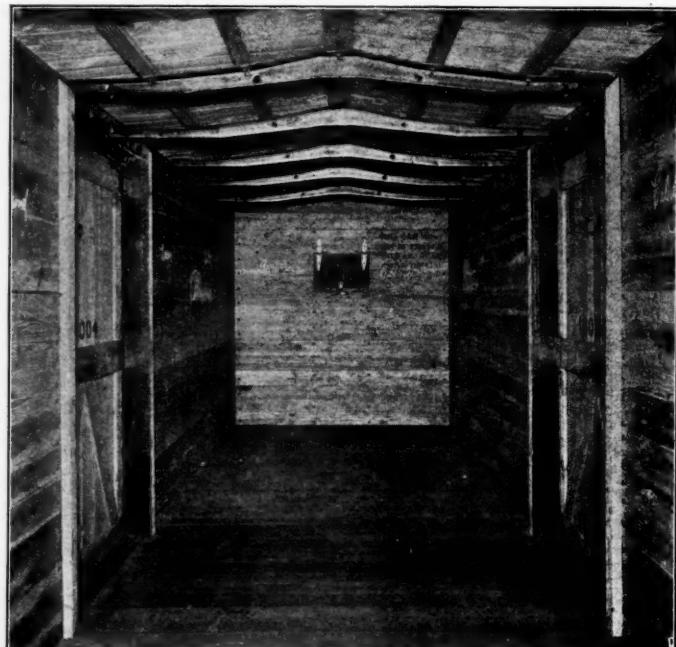
these strap tie bars at each end of the car and four on either side; by screwing up the nuts at the bottom of the straps a total adjustment of 3 in. may be obtained.

The cars have standard 5 ft. side doors, and some of them have two end doors, the upper and larger one being for lumber loading, and the small door near the floor for steel rails. These cars are easily repaired when damaged, the outside posts and braces serving as a protection to the sheathing which is seldom



End Door Construction; Canadian Pacific Box Car.

of the frame with ½ in. bolts, the holes for the bolts through the steel posts and braces being slotted. This provides for the necessary adjustment due to shrinkage when the lumber from which the sheathing is made is green or not perfectly dry when it is applied. The sheathing extends about 3 in. above the bottom of the plates, and if it dries out or loosens up sufficiently to develop cracks between the planks, the bolts may be slackened off and the sheathing pulled together by means of steel strap rods, which extend up on the inside and hook over the top board; the bottom end is forged round and extends through the steel side sill and is threaded for a nut. There are two of



Interior of Steel Frame Box Car; Canadian Pacific.

injured. The inside of the car presents a smooth surface and is well adapted for carrying grain, or similar lading. The American patents for cars of this type are owned and controlled by Wm. V. Kelley, R. P. Lamont and W. W. Butler.

MR. CLAUSEN ON SIGNAL ASPECTS.

L. R. Clausen, superintendent of the Chicago, Milwaukee & St. Paul, at Chicago, and formerly president of the Railway Signal Association, read a paper before the Canadian Railway Club at Montreal, on Tuesday of this week, replying to that of Mr. Rudd, of the Pennsylvania, which was read before the same club last November. Mr. Rudd is chairman of the committee of the Railway Signal Association, which has reported the well-known scheme for a uniform system of signaling, and Mr. Clausen is one of the leaders of the minority of that committee which objects to some of the conclusions of the report. Mr. Rudd took occasion at Montreal to set forth his views on the general subject which had been dealt with by his committee, and now Mr. Clausen presents the opposite side.

Mr. Clausen gives a brief sketch of what has been done since the subject of aspects was first taken up in a systematic manner six years ago, noting that before that it was dealt with by Mr. Sperry, in a paper before the Signal Association in May, 1903, and by a committee headed by C. H. Morrison in November of that year; by a committee of the Pennsylvania Lines in 1903, and by a committee of the New York Central Lines appointed in 1904.

The first report of the Rudd committee was made at Washington in 1906; in this 24 indications being provided for. At Milwaukee in October, 1907, a revised report was made, which was approved by the association. In March, 1908, this report was presented to the M. W. Association at Chicago, and substantially approved by that association. At Washington, in October, 1908, the Signal Association committee presented another

report, containing a new list of indications and otherwise modified. This report was accepted as a progress report. It came up again before the M. W. Association in Chicago the following March, when Mr. Stevens of the Atchison, Topeka & Santa Fe, a member of the committee, presented an additional list of aspects, 23 in number. At this meeting it came out that Mr. Stevens, Mr. Clausen and others were not satisfied with the report of the majority. In October, 1909, a third report was presented, further modifications having been made. This report provided for 16 primary indications and 4 secondary, and recommended among other things the use of lunar white lights. The minority presented a brief dissenting statement. This report when sent to letter ballot, failed of adoption. In the following March the differences in the committee came out again at the M. W. Association, and so the committee was instructed to take the whole matter before the American Railway Association; and there it now rests, the committee of that association having taken no action.

Continuing, Mr. Clausen said:

Present Differences of Opinion.

As a member of the minority referred to, I desire to take this opportunity to explain some of the differences of opinion that resulted in a minority report. I also wish to state the minority's position clearly and remove any wrong impression you may perhaps have gained from the paper read before this Club by a prominent member of the majority some time in November. I refer to Mr. Rudd, of the Pennsylvania Lines East, who is justly celebrated as a signal engineer, and whom I claim as a warm personal friend.

As to the Number of Indications and Aspects.

The majority recommends a system of signaling which includes 14 primary indications and 4 secondary. It requires a large number of aspects or pictures to represent them, nearly 60 in all. We, the minority, take the position that there is no demand for such an elaborate scheme and that it is impracticable, unnecessary, and confusing to the runner and other train employees. We believe that, regardless of the large number of aspects used to represent the indications, train employees will classify certain of them as meaning *stop*, certain of them as meaning *caution*, and the remainder as indicating *proceed*. The engineer frequently is compelled to read signals under very adverse weather conditions and, if he is to run safely, he should never be in doubt as to the meaning of a signal. A signal should mean something perfectly definite to him, which he cannot mistake, under any conditions of wind and weather. The engineman has no time to hesitate or deliberate over the meaning of a signal when he is running at high speed.

The aspect and its meaning must be so simple and so distinct that it immediately produces an impression on the mind of the runner, without the necessity for any intervening thought or mental process. If this impression should be followed by an involuntary action to comply with the signal without mental process we have a still more desirable condition and one that makes for safety and immunity from accident. To obtain these results the number of indications and aspects must be limited to a very small number, we believe less than half a dozen, and signals must be acted upon as a train meets them, and not at some point in advance, as the majority recommend.

As to the Use of Three Stop Indications.

Because of the fact that the majority has provided several different proceed aspects, it is necessary for them to use three stop aspects. That is to say, if several different arrangements of signal arms are used to indicate proceed, it results in several different stop aspects when those arms are restored to their normal position. These aspects are called:

1. Stop until authorized to proceed
2. Stop and proceed
3. Stop and investigate

The minority is unable to see why it is necessary to show on

the face of a signal why a train must stop, or what it may or must do after it has stopped, before the stop is made. The all important and the only necessary information is that the train must stop. Why telegraph ahead by a specially shaped signal what the stop is being made for? One kind of signal will stop all trains just as effectively as three or more kinds.

As to Use of Three Arms on Interlocking Signals.

The majority has assumed that there are three permissible speeds at interlocking plants, viz.: normal, limited, and low. Each speed is provided with a signal arm, the normal-speed arm being at the top of the mast and each arm arranged for operation in three positions. This arrangement makes it possible to give a considerable variety of information. The limited-speed indication is designed to make possible a speed of thirty to fifty miles per hour through long crossovers.

The minority feels that the method now largely used of providing a two-arm signal, giving a proceed indication by means of the upper arm for the normal speed or through route, and a caution indication by means of the second arm for all diverging routes, is entirely sufficient for practical purposes. We favor, however, the use of the same proceed and caution aspects as are used elsewhere, which make it unnecessary to use more than one arm on signals used at interlockings. It seems unnecessary to say more than "Proceed" when the normal or through route is set up, and if so, why not use the same proceed aspect as is used elsewhere for proceed? In the same way we now give with the second arm, what is, in effect, a caution indication when a diverging route is set up, why not then use the caution aspect we already have available and dispense with the use of the second alarm? We believe that the indications stop, caution and proceed, given by the three positions of a one-arm signal, are entirely practical, sufficient and adequate to safely control the movement of trains at interlocking, as they will elsewhere. The simplicity of the arrangement is apparent.

The Interpretation of the Caution Indication.

The majority has provided no caution aspect per se, but has attempted to provide separate indications and aspects for each of the conditions arising on a railway that require caution. The 45-degree position of the arm has been limited to repeating signals in advance. In the various discussions of these matters, the majority has held that the word "caution" described the "function of a distant signal." Also it has been held that the 45-degree position of the arm should "imply and assure clear track to the next signal." The same aspect, modified by the addition of a distinctive mark for both day and night, is recommended for the permissive manual block signal. The distinction is made because the first indicates

"Proceed with caution to a known point."
and the second,

"Proceed with caution to an unknown point."
Also for the further reason, the members of the majority state, that trains shall be allowed to pass the distant signal at any speed provided they can be stopped at the next signal. They state further that serious delays to traffic would follow if engineers were compelled to observe the distant or caution signal at the signal. The indication is worded "Proceed—Prepare to stop at the next signal," which leaves it optional with the engineer when he shall cease regarding the first part of the indication and begin to regard the second part.

The minority regards this interpretation of the distant or caution signal as erroneous, dangerous and productive of laxity in the observance of signals as well as accidents. A number of serious and fatal accidents in the past few years, wherein the engineman failed to properly observe the caution signal, but fully intended to stop at the next signal, testify most conclusively to the correctness of our position in this matter.

We hold that:

1. It is impracticable to provide a separate signal for each of

the conditions on a railway requiring cautious running and to maintain the fine-haired distinctions necessary to their interpretation.

2. It is unnecessary, and in fact dangerous, to tell the engineer by fixed signal how he shall control his train at some point in advance.

3. Advance information so given is misleading and unreliable, as it is subject to change without notice and, therefore, the engineman can not safely use it. If he does so use it, it is done at the expense of safety.

4. The conditions of modern railway operation do not require trains to be run at full speed past caution signals, and that any time gained by this practice, is gained at the expense of safety.

5. Each signal should indicate *stop* or *caution* or *proceed* and have no relation to signals in advance or in the rear.

6. That each signal should be observed in turn as the train comes to it and not at some point in advance at the option of the engineman.

7. That with signals properly located, it is time a train should be run with caution if it has reached a point so close to preceding trains or stop signals in advance that a caution signal is received.

8. That no proceed or caution indication should "imply or assure clear track to a point in advance." That railway signaling devices and our methods of communication have not reached the perfection that will admit of this being done. We cannot know positively if the track is clear and further, it may not stay clear. We are under a moral obligation not to give such misleading information.

9. That the giving of information by signal indications about conditions in advance, whether it be regarding the next signal or the next station or any other object or condition, is wrong practice, productive of laxity and a fruitful source of danger and accident.

10. That it will be difficult, if not impossible, to maintain discipline and proper observance of the great variety of caution indications proposed by the majority because of the fine distinctions involved.

As to Low Speed Indications.

In the majority's recommended scheme appear

Indications 13—Proceed at low speed.

14—Proceed at low speed, prepare to stop.

We feel that a simple caution indication, combined with ordinary judgment on the part of employees, will avoid the use of these indications and the separate aspects used to represent them. Why use two? If the engineer is running at low speed, he is already prepared to stop.

As to Number of Red Lights Displayed.

One of the principal objections made by operating officials and train employees to signal practice at interlockings in the past, has been with regard to the number of red lights displayed. Also, objection has been made because it is necessary for engineers to disregard and run by one or more red lights on a mast when passing a signal having more than one arm. A glance is sufficient to show that the number of red lights would be very largely increased under the plan recommended by the majority. This is principally due to the use of the red marker light on nearly all signals. We feel that it is against the principles of good operation to provide so many red light signals, and especially those that are not used. We also feel that all red lights that are not absolutely necessary should be eliminated.

Harmony With Standard Code.

Attention is called to the fact that the standard code of the American Railway Association shows at present but four indications. The majority feels that the code is incomplete and should be amplified by the addition of 10 more primary and

several more secondary indications. We are of the opinion that the code contains all the indications that are necessary and needful.

Present Status of Signaling.

At the present time—speaking in general terms—the signaling of America is represented by a small mileage rather intensely signaled and a very large mileage with a very few signals. One, at least, of the causes contributing to this condition is the fact that much of the signaling already installed has been so elaborate that the expense has been prohibitive for thinner traffic lines. Further than this, the "elaboration of interlockings at many of our crossings, junctions and terminals has been carried to a foolish limit of unnecessary and impracticable attempts to tie up every human action, leaving nothing to discipline and good sense of employees. Also, great expense has been unnecessarily incurred to overcome human frailty by installing more complicated lockings and appurtenances than are demanded by the conditions."

It has been our custom to spend large sums of money on appliances for checking the work of the individual employee but, on the other hand, very little or none on the man himself. Each new accident has called for additional checks and devices when the true remedy for the condition lay with education, discipline or, perhaps, some similar action. We are in all the United States, prone to make new laws or legislation for every condition or abuse, when old laws, properly enforced, will take care of the situation. It is the same in the operation of railways.

It should always be borne in mind that it is impossible to prevent all accidents by means of new checks or devices, as these appliances are all subject to failures and do fail in the same ratio as other signal devices. Further, all of these checks tend to laxity on the part of employees, which is, in itself, a source of accident. New circumstances always arise, whatever checks and appliances are installed. Everything cannot be done by machinery and apparatus; something must be left to human intelligence.

Because of certain accidents, we have heard much recently with regard to automatic stops. I do not, personally, recall any that could not have been prevented by the proper instruction of employees and good discipline. From the often-quoted records of the English railways in handling passengers, I judge that travel on English railways is reasonably safe and that the record is fairly satisfactory. Let us not forget that this record is made without the use of automatic stops or other checks and under conditions that are substantially worse than exist in America, on account of the prevalence of fogs.

True Function of a Signal.

The true function of a fixed signal is to control train movement. It is not the function of a fixed signal to show in its aspect or appearance the specific purpose for which it is being used. I know of no better definition than the one in the Standard Code, which reads as follows:

"A fixed signal covers such signals as slow boards, stop boards, yard limits, switch, train order, block, interlocking, semaphore, disc, ball or other means of indicating stop, caution or proceed."

The function of a stop signal is to stop trains, not to indicate by its appearance why the stop must be made. The same is true of a caution signal.

The signal engineer, with his intimate knowledge of the mechanical and electrical construction and inter-connection of signaling devices, sees circumstances and opportunities under which slightly increased speed may be maintained. To obtain this result, an elaborate scheme of indications and aspects has been recommended which involves refinements designed to give shades of meaning that are unnecessary, confusing, and bound to be very expensive to install and maintain. We believe that any benefits to be derived are imaginary rather than real; that any increase in speed will be at the expense of safety.

The complicated scheme advanced introduces fine differentiations of caution and speed indications which require prompt reading as they are met, and remembrances for execution when some point in advance is reached. We believe that there are too many localities and sets of conditions to permit of representing each of them by fixed signals. The signal engineer has assumed a burden in attempting to do this, which is not justified by the experience of operation of trains.

Generally speaking, the simplest scheme of signals and the smallest number of indications and aspects that will do the work is the best one to use. We believe that the indications *Stop*, *Caution* and *Proceed*, with corresponding three aspects, will do the work and take care of practically every operating condition, if due investigation is made. We believe further that the present diversity of practice, which has finally resulted in the recommendation of the elaborate scheme presented to the Signal and Maintenance of Way Associations, is due to the adoption and use of new forms of indications and aspects without full investigation of the signaling principles involved or the possibilities of the simple scheme, *Stop*, *Caution* and *Proceed*.

It should not be overlooked that the relative chance of error on the part of train employees under any two signal schemes, is probably represented by the ratio of the respective squares of the number of aspects.

THE NEW HAVEN VALUATION.

The valuation of the New York, New Haven & Hartford properties, just completed under the order of the Massachusetts legislature, is a pioneer valuation of its kind. State valuations have heretofore been made by Michigan, Texas, Washington, Wisconsin and Minnesota; but that made by Massachusetts is the first to include an interstate railway system, one operating in four states. Moreover, it has been undertaken not merely with the assent but with the eager co-operation of the railway itself, seeking validation by Massachusetts of the company's securities—the expense to the company being about \$100,000. The Massachusetts Board of Railway Commissioners, the Tax Commissioner and the Bank Commissioner as official principals in the valuation have had under them a host of experts headed by Prof. G. F. Swain of Harvard, who makes the leading report and whose investigations have reached into every branch of the property—physical, financial and historical—and have covered several months of time. A report follows that fills more than 300 typewritten pages, of which Prof. Swain's section alone comprises 163. The valuation, subject to some minor criticisms to be made later, is of commendable thoroughness both in method and material. It has relied, in part, on the valuation of Vice-president Stevens, made by him as an officer of the company and completed some two years ago; but as the experts brand his valuation conservative the appraisal gains rather than losses in its accuracy by that fact.

Coming immediately to the figures, the physical valuation gives the following comparisons in its more important items:

	Stevens' Appraisal	New Valuation.	Depreciated Valuation.
Engineering	\$4,470,894	\$5,574,038	\$5,574,038
Right of way and station grounds	55,935,451	62,789,016	62,789,016
Real estate	3,289,573	5,240,052	5,240,052
Bridges, trestles and culverts	20,496,112	20,917,682	17,780,030
Ties	2,404,764	4,646,658	2,787,995
Grading	28,224,823	30,263,853	30,263,853
Rails	6,918,565	8,777,985	7,022,388
Ballast	4,946,114	3,970,389	3,970,388
Crossings and signs	4,856,374	4,989,436	3,492,605
Shops, engine houses and turn tables	1,879,713	2,725,112	2,043,834
Docks and wharves	5,128,766	5,753,705	5,301,593
Electric power plants and property	1,266,107	6,215,690	5,594,121
Equipment	33,684,640	77,557,514	54,145,056

Including interest and commissions, the totals of the Stevens valuation was \$283,024,858. As appraised by the commissioners, the physical property is valued at \$279,871,460, excluding trolley lines. The latter are held by stocks and bonds as of subsidiary or holding companies and are, presumptively, excluded from both the Stevens and commission valuations of physical property.

As distinguished from comparative valuations of physical and other properties, the general summary of the commissioners shows the contrasts of book values with their appraisal. They have applied in the case of the securities various tests depending on the nature of the securities held—such as earning power of the various properties, their physical valuation based on replacement, market values and their dividend returns. In some cases book values sink greatly, in others they go up. But the net result is a large gain, as was to be expected, in the surplus of the company as compared with the balance sheet of the last annual report, where it was returned as \$14,196,253. Contrasted with those figures the "readjusted surplus" of the commission appraisal now rises to \$102,133,237 on a total valuation of \$496,280,081—this not including certain "intangible" assets, franchises among them to be referred to later.

Some of the details in these subtractions and additions are interesting. Thus in the Rhode Island trolleys the New Haven's interest is valued at about \$6,000,000, or one-quarter of its cost to the New Haven. In the case of the New England Navigation Company, the so-called "cold storage" holding corporation of the parent company, there is a reduction from book values \$17,569,572 to \$8,710,174. So in the case of the New York, Westchester & Boston—the New Haven's White Plains extension, with its Bronx terminal—the New Haven is allowed but \$12,066,921, as against actual investment of \$21,279,594. On the other hand there is the great increase of the Harlem & Portchester appraisal to \$41,222,191, as against a book value of \$25,334,833; and of the New Haven company's Central New England investment, where at the commission's valuation of stock alone the book value of \$1,582,066 would rise to \$4,470,450, saying nothing of two or three millions more increase in the income and other bonds—and the commission valuation of the Central New England shares, especially of the common stock, is apparently low. The appraised value of investment securities is \$184,319,763, which compares with a book value of \$204,866,998.

The commission excludes from its appraisal "intangible" assets of the company, which, however, it describes as very valuable, including the franchises. Among them and of somewhat specialized interest is the New Haven's traffic contract between Woodlawn and the Grand Central station, which on the basis of taxation the commission estimates at \$5,940,428, but as "intangible" excludes from its valuation. The commission could have emphasized its views on franchise value still further by reference to franchise taxes or—in the specific case—the millions paid by the New Haven for the "Milbrook" franchises underlying its New York, Westchester & Boston extension. But omission of such indeterminate values, expressed by final analysis usually in the earning power of a corporation, was undoubtedly the better theory for a state commission charged with the validating of securities by appraisal of concrete assets. It would hardly, however, have been amiss for the commission to have pointed out more clearly than it has the relations of copious stock watering to values in the case of the Rhode Island and Connecticut trolleys, in which the investment holdings of the New Haven are so large. An "intangible" value there—besides their obstructive value as against competing parallels—is their steady expansion of earnings. But it is a value not yet realized.

In his own very able section of the report Prof. Swain sets forth at length his views of the principles guiding such a valuation, in which views students of railway affairs will find a wealth of suggestion. Railway valuation, he says, can be considered from several viewpoints—as a basis of taxation, as a basis of present capital, of issue of securities, of rates, of estimate of wealth of the nation. He holds that physical valuation is not a measure for rates and that, if rates are not unreasonable in themselves, a fair return should be allowed on total capital, including the risk of the undertaking; that physical valuation is not a scientific basis for estimate of public wealth, for that wealth depends on the value of the property as a going concern; that as to securities held the value now is the proper

basis of capital; that a railway should be allowed to earn a proper income on appreciated capital; that replacement value is not an absolute test—a seasoned roadbed, for example, being more valuable than a new one; that a railway as a whole, should practically be kept in operation as good as new, and the cost of doing it charged to operating expense, while the company should be allowed rates sufficient for full repairs and renewals. To quote Prof. Swain's words: "Physical valuation, either for the purpose of justifying rates or capitalization, should fairly allow the appreciated value of real estate and any other elements which have appreciated . . . provided the property is maintained in good condition." It will be undoubtedly a source of gratification, both to the corporation and the public, that Prof. Swain reports the physical condition of the New Haven's property remarkably good.

The main body of the commission report reviews at great length the legal—and illegal—relations of the New Haven Company to the state of Massachusetts, and refers to the discontinuance of the state and federal suits. In that connection the commission does not say that for thirty years or more Massachusetts, in law vulgar, "slept on her lights," and did not wake up until the New Haven began to acquire trolleys in the State. Nor does the commission explain that the transfer of the trolley holdings and the Boston & Maine share to individuals and to a "sympathetic relation," which could not be legally assailed, was the real block to both the federal and state suits. Coming to remedies, the commission wisely urges that the new and brave liberal policy of the state in the matter of railway capitalization and acquisition of securities and properties be made to square with her law. Attacking next the knotty problem of the divergent and, indeed, rival policies of Massachusetts and Connecticut and the New Haven Company's claim of general rights under its Connecticut charter, the commission insists on the co-ordinate and restrictive power of Massachusetts as regards general acts of the corporation and matters not localized in another state. But, admitting the difficulties of the past and danger of their recurrence, the commission urges uniform legislation in all the New England states. Should the New Haven continue to disregard Massachusetts law and policy, the commission recommends as penalties the taxation of New Haven stock in the hands of resident holders, the closing of the savings banks and other financial institutions of the state against the company's securities, and the personal liability of the corporation's officers.

The commission refuses to validate \$50,000,000 of new stock issued by the company and three-quarters paid in on a basis of \$125 per share, on the ground that the new issue must receive approval of the Massachusetts authorities or the company file affidavit that the proceeds are to be used outside the state. But it validates \$394,147,563 of the company's liabilities, eliminating \$56,616,818 from the corporation's last annual report.

The report and the appraisal of the railway property have several points of acute interest for railway men; but two of them stand out prominently. At the end of several years of controversy involving the legislature and costly litigation in the courts, and at one time reaching out into state politics, Massachusetts has now so far surrendered as to leave the Boston & Maine under New Haven control and validate the great mass of New Haven securities, many of them held by her courts to have been illegally issued or acquired. But the state still leaves invalid the New Haven's acquisition of several hundred miles of trolleys in the state, while submitting to the fiction under which the New Haven maintains control by the indirection of a holding company, individual control of that company and a "sympathetic relation" to the real corporate owner. And the state still leaves the bars down for future and indefinite friction amid the conflicting statutes and policies of New England commonwealths. This is one point. The other is that the official appraisal of the New Haven, a work of remarkable skill, thoroughness and fairness when the short time allowed and the complexion of the property are considered, gives a surplus of more than \$100,000,000 in a general balance sheet—very much more

if intangible assets are reckoned in. On the basis of the valuation, the stock of the company is shown to be worth at least 175, while selling in the market at some 25 points less, and the company not quite earning its 8 per cent. dividend. Such a contrast between valuations much increased from book value, but a part of the corporation's necessities, while defective in separate earning power is impressive. But the appraisal has at least the value of impairing public criticism of dividends and rate charges based on a "fair return" on the property. Finally, there is a phase of the matter bearing specifically on the New Haven's financial and physical policy. It has greatly expanded its system and is still expanding it, paying high prices for new lines and for some of its extensions. During this transition period of rapid growth a large divergence between capitalization and valuation, on the one hand, and net earning power, on the other, must be expected. One cannot yet foresee what the net earning power will be later when the system becomes more closely welded, when revenues from 1,400 lines of trolleys increase, when advances like the \$21,000,000 already plowed into the New York, Westchester & Boston extension begin to make returns from operation—and when reciprocity with Canada, if that comes about, supplies new traffic.

PERFORMANCE OF PACIFIC TYPE LOCOMOTIVE; PENNSYLVANIA LINES.

A heavy passenger locomotive of the Pacific type that had been built for service on the Pennsylvania Lines West for hauling heavy trains between Pittsburgh and Chicago was described in the *Railway Age Gazette* of August 30, 1907. The locomotive has cylinders 24 in. in diameter with a piston stroke of 26 in., and weighs 272,500 lbs., in working order, of which 183,900 lbs.

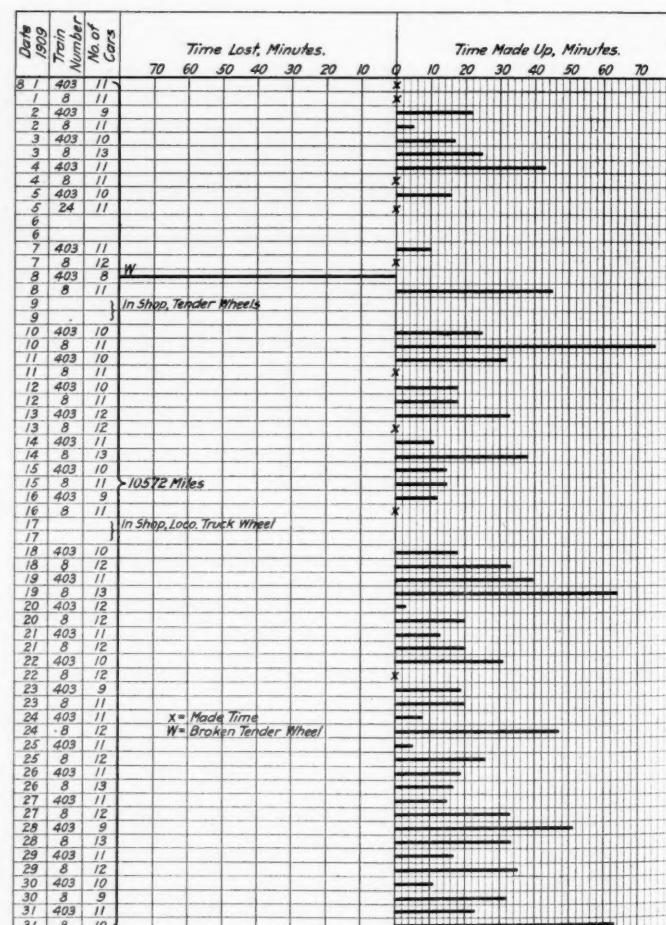


Diagram Showing Performance of Pennsylvania Lines Pacific Type Locomotive During August, 1909.

are on the drivers. The average weight per driving wheel is but 30,650 lbs.; the front drivers carry 61,000 lbs., or 30,500 lbs. per wheel. The driving wheels are 80 in. in diameter and the boiler has a total heating surface of 4,448 sq. ft.

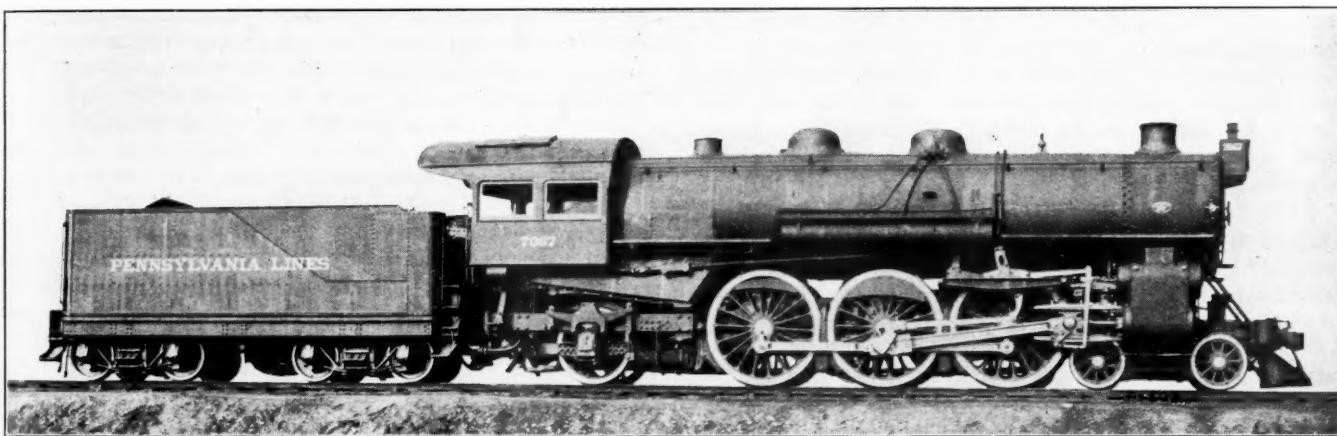
One locomotive of this class was built and in service a year before the publication of a description was authorized. The reason for its construction was that the weights of trains on the Northwest system had become so great that the ordinary engines were having difficulty in handling them. It was undecided whether the weight of the locomotive should be increased or whether the trains should be divided and run in lighter sections. The engine was designed therefore, somewhat in the nature of an experiment and in order to be prepared for the construction of a class of heavy engines if the management should decide to operate the heavy trains. The Pacific type was chosen in order that the weights per driving wheel might be kept about 30,000 lbs.

The locomotive was put in service in August, 1906, and from that time on was closely watched in all of its daily performances, in order to correct any defects that might develop and to be certain that in a duplication of the design no mistakes should be made. The results obtained in this long trial have been so satisfactory that orders have been placed for a number of these engines for the lines both East and West, some of which have been delivered.

These locomotives were designed for service between Pitts-

Detentions due to	
Springer hanger broken	1
Piston rod broken	1
Coupler knuckle broken	1
Tender wheel broken	1
Transmission bar broken	1
Main driving axle broken	1
Total detentions	36

The form in which the record was kept is shown in the illustration; the central line indicates schedule time and the horizontal lines extending to the right and left the minutes made up or lost on individual runs. The diagram shows the service rendered during the month of August, 1909. It is taken at haphazard from a number that are available and shows that, for that month, the engine either ran on scheduled time, or made up time in every case but one, when there was a delay of 80 minutes due to a broken tender wheel. It was hauling trains Nos. 403 and 8 between Pittsburgh and Crestline. No. 403 from Pittsburgh to Crestline might be called a fast local. It makes 15 stops in 175 miles and hauls 11 cars; the schedule time is 4 hr. and 40 min., or an average of about 37.5 miles per hour. This, of course, means a much higher speed between stations and a rapid acceleration. No. 8 from Crestline to Pittsburgh is a slightly heavier train and has a slower schedule. It makes the run in six hours with from 12 to 13 cars, and with 13 stops. This gives an average speed of 29.2 miles per hour, including stops.



Pacific Type Locomotive; Pennsylvania Lines.

burgh and Chicago, via Crestline and Fort Wayne. The line is divided into three divisions with terminals at Crestline and Fort Wayne. The lengths of the divisions, starting from Pittsburgh, are 188, 148 and 131 miles, respectively. The line has an undulating profile with maximum grades of about 1 per cent. The trains hauled varied in length from 8 to 13 cars, with an average for the express service of about 12 cars. Accommodation trains are shorter. A résumé of the log of the engine, working under these conditions and covering the period from August 1, 1906, to January 1, 1910, is as follows:

Performance of Locomotive 7067 in Passenger Service.		
Made time	133 trips	21.6 per cent.
Made up time	446 trips	72.5 per cent.
Lost time	36 trips	5.9 per cent.

Total number of trips	615	
Total mileage		117,137
Detentions due to		
Not steaming	10	
Hot driving boxes	10	
Hot crank pins	1	
Injector failure	1	
Pump failure	2	
Loose wedges	1	
Steam hose	1	
Taking coal	1	
Flues leaking	1	
Gage cocks leaking.....	1	
Lap and lead lever broken	1	

The diagram shows, by the way in which time was made up as occasion demanded, that the engine could really play with these trains. On the 10th of the month for example, 75 minutes were made up on No. 8, cutting the running time down to 4 hr. and 45 min., or a speed of 36.8 miles an hour with 13 cars and 13 stops in 175 miles. There was hardly a run on which some time was not made up.

The engine steams freely and the fireman has no difficulty in maintaining the steam pressure over a division. And finally the machine rides easily and, for a locomotive, quietly. It is, therefore, on the basis of these performances that the design has justified itself and that the class will continue to be used in the heavy traffic of the Pennsylvania lines both East and West.

Final plans for the extension of a branch of the Central of Brazil Railway which will connect the station, G. Portella, on that railway with Vassouras on the Spaucahy Railway, also for the extension of a short line to Itacurussa have been approved. One of the most important of the recent extensions on the Central is to be a branch to Monte Claros, 37 miles long, and to cost \$800,000. Twenty-one miles of the line running north from Lafayette are to be changed to broad gage in accordance with the general plans for the standardization of the main line of the Central of Brazil running into the state of Minas Geraes from Rio de Janeiro.

SOME REFLECTIONS ON THE RATE CASE DECISIONS.

Railway men having recovered from the first shock of the decisions of the Interstate Commerce Commission in the rate advance cases, have had time to do a little reflecting about the principles on which they were based. One point which the decisions settle is that the commission ought not to use its authority to control advances in rates in the same way the English commission does. As Commissioner Lane points out, what the English law requires the commission to do is to determine whether "the increase of the rate or charge is reasonable." On the other hand, what the Interstate Commerce Commission is required to do is to find out whether the increased rate is reasonable. The English commission construes the law under which it acts to mean that the carrier must show that there has been an increase in the cost of handling the specific commodity on which it is proposed to raise the rate. As the amended Interstate Commerce act only requires the Interstate Commerce Commission to ascertain if the increased rate is reasonable, it is unnecessary for it to inquire whether there has been an increase in the cost of handling the specific commodity; for it is possible a rate may be too low as compared with other rates, and, therefore, an advance in it may be reasonable even if accompanied by an actual reduction in the cost of transporting the particular commodity. The burden of providing the reasonableness of the higher rate is put on the carrier; but this is a very different thing from putting on it the burden of proving that the specific advance itself is reasonable. It is curious that while the commission fully recognized the fact that it was its function to decide, not whether the advances in rates were reasonable, but whether the advanced rates were reasonable, it really did decide, as the language of its opinions plainly shows, not that the advanced rates were unreasonable, but that the advances were unreasonable.

* * * * *

The commission, especially in Mr. Prouty's opinion in the eastern rate case, fully and explicitly recognized the fact that whether a railway or a group of railways is or is not earning a fair return on its mere physical valuation is not the sole criterion of the reasonableness of its rates as a whole; and it discussed at considerable length the other factors in the value of a railway which the Supreme Court, in *Smyth v. Ames*, said must be considered. But its language plainly implies that it believes that preponderant consideration should be given to the cost of physical reproduction, and it indicated that a physical valuation would introduce into the question of rate advances an element of great importance. In fact, its general tone indicated that if it had had available a valuation as a guide its decision might have been different. In other words, it has been able for years without the aid of a valuation to determine that rates ought to be reduced; but it is unable to determine without the aid of a valuation that they ought to be raised.

The railway which most directly presented the question of valuation was the Burlington. Its counsel contended that it had a constitutional right to earn at least a fair return on the physical value of its property, and that while the original investment was about \$29,000 per mile of road, it was entitled, owing to the increase in the value of its property, to earn a return on about \$60,000 per mile of road. Commissioner Lane, in the opinion in the western case, struggled long and desperately to escape from this logic. He said:

Our position is that a railway may not increase rates upon shippers for the reason and as an outgrowth of the fact that it has accumulated out of rates a balance of profit which has been invested in the property.

Again, commenting on the contention that the railway is entitled to earn a return on its "unearned increment," he said:

In a very real sense, these added land values do not come to the railway as a railway, but as an investment in land which has been dedicated to a public use; and being so dedicated it may be strongly urged that the increment added thereto from year to year by communal growth is an imposition of additional rate burdens upon the public.

Again, he said:

It is a conservative statement of the law to hold that a railway may not increase the rates upon a number of commodities solely because its real estate has risen in value.

It is no doubt true that a common carrier may not increase the rates on a number of commodities *solely* because its real estate has risen in value. Nobody contends that a railway may charge excessive rates in order to earn a fair return, or any return, on its value. But suppose it seeks to raise its rates, not solely because of an increase in the value of its real estate, but because its operating expenses have increased, because the value of its property has increased and because the advanced rates are reasonable in themselves. Then an entirely different question is presented. The valuation theory, as enunciated by its advocates, seems to be a jug-handle affair. According to their view, if it can be shown that a railway is earning more than a fair return on its valuation based on its cost of reproduction, its rates should be reduced or, at least, should not be permitted to be raised; but if it be shown that, owing to the increase in the value of real estate and other causes, it is not earning a fair return on the physical value of its property, it may not be permitted to raise its rates. The *Railway Age Gazette* long since pointed out that the valuation scheme is a two-edged sword, and that its logical use would involve, as real property increased in value, increased in rates to enable the roads to earn a fair return, rather than reductions, to prevent them from earning more than a fair return. The Supreme Court of the United States, in the *Consolidated Gas Company* case, held in express words that the value to be considered is the value of the property at the time the rates in question are under consideration, and that if the value of the property of a public service corporation had risen, this increased value must be taken into consideration. In view of its past decisions, it is very hard to believe that the Court will ever agree with Mr. Lane, that physical valuation should be used as a basis for reducing rates, but that an increase in physical value caused by an increase in the value of real estate or investment of earnings, cannot be used to justify advances. We have never taken much stock in the valuation theory; but if it is to be accepted as a basis for railway regulating policy, it must be adopted as a whole, and under all circumstances, and not merely in those instances where it will justify reduction, or the prevention of advances, in rates.

TABLE—EASTERN ROADS.

	Passenger density per mile.	Passenger train revenue per mile.	Freight density per mile.	Freight revenue per mile.
Average for groups I, II, and III	231,700	\$4,989	1,862,000	\$12,146
Pennsylvania R. R.	367,489	9,014	4,409,694	24,982
Pennsylvania Co.	260,073	6,591	3,682,407	22,102
New York Central....	474,153	10,473	2,293,914	14,221
L. S. & M. S.	334,965	8,946	3,421,211	17,823
Michigan Central	185,216	4,523	1,565,257	9,697
Baltimore & Ohio.....	172,127	4,019	2,313,510	13,444

If the policy of limiting railway profits is to be adopted, it would seem that, as the commission said in the Spokane rate case, the whole situation should be taken into consideration. The rates must not be made with reference merely to what the stronger lines or the weaker lines can earn on them, but with reference to what the average road can earn. The language of the commission in the rate advance opinions would indicate that it accepted and applied this principle in these cases. The facts show it did not. In the eastern rate cases it took the Pennsylvania Railroad, the Pennsylvania Company, the New York Central, the Lake Shore & Michigan Southern, the Michigan Central, and the Baltimore & Ohio as "typical" roads, and investigated their situation for the purpose of determining what are the needs of the railways in general in Official Classification territory. Official Classification territory is composed of what are designated in the statistics of the commission as groups I, II and III. The above table gives the average passenger and freight

densities per mile and the average passenger train earnings and freight train earnings per mile of all the roads in these groups in 1909, and also of the roads used by the commission as typical:

It will be seen that the passenger densities and the passenger train earnings of all the roads used as typical, except the Baltimore & Ohio and the Michigan Central, are greater—in some cases very much greater—than the average for the territory, and that the freight density and the freight revenue of every road taken as typical, except the Michigan Central, are greater than the averages for the territory. The roads selected as typical are not typical at all, but are very much better situated and more prosperous than the average.

The roads taken as typical in western territory are the Santa Fe, the Chicago & Alton, the Burlington, the North Western, the St. Paul and the Rock Island. The following table for western territory corresponds to the one given for eastern territory:

TABLE—WESTERN ROADS.

	Passenger density per mile.	Passenger train revenue per mile.	Freight density per mile.	Freight revenue per mile.
Average for groups VI, VII and VIII	97,304	\$2,315	675,764	\$5,683
Santa Fe	123,905	3,163	678,717	6,956
Alton	210,263	4,622	1,342,532	7,656
Burlington	117,058	2,721	733,745	5,790
North Western	122,092	2,754	636,972	5,713
C. M. & St. P.	89,736	2,190	672,485	5,637
C. R. I. & P.	122,914	2,709	530,131	4,935

It will be noted that every railway in the group, except the St. Paul, has both a greater passenger density and greater passenger train earnings per mile than the averages for the group; that three of the so-called "typical" roads have a greater freight density than the average, and four greater freight earnings per mile. The selections made in western territory are not open to as severe criticism as those made in eastern territory. Just the same, everyone knows that these roads are generally recognized as better located and managed than the average road in the middle west.

In his opinion in the eastern rate case, Commissioner Prouty said, "No general advance in rates should, however, be permitted until the carriers have exhausted every reasonable effort toward economy in their business." This statement is unexceptionable. It recalls, however, a story about a conversation between Madame de Staél and Sir James MacIntosh. "Napoleon," said Madame de Staél, "is not a man. He is a system." Sir James loudly applauded the statement. But a hard-headed gentleman who was sitting by disturbed the serenity of the occasion by saying, "Yes, it is fine; but what does it mean?" That the carriers should not attempt to impose an added burden of rates on the public to increase their net earnings until they have done all they "reasonably" can to get their operations on an economical basis is a truism. But what economies are reasonable? Would a reduction in wages be reasonable? The railways between Chicago and St. Paul recently, in order to effect economies, have taken off some trains and lengthened the schedules of others. Is that reasonable? The roads could refrain from spending such large sums as many now are on handsome passenger stations. Would that be reasonable? They could very substantially increase minimum carload weights and compel shippers to load the large cars now in service much nearer to their capacity. This would effect a great economy. Would it be reasonable? There is no man connected with or familiar with the railway business who cannot suggest scores of ways in which great economies could be effected. But there is hardly a method that could be adopted without incurring antagonism and opposition either from employees or travelers or shippers. There are many economies which railway men firmly believe it would be reasonable to make, and the language of the commission in these opinions gives them a good right to ask that, when they try to

make them, they shall have at least the moral support of the commission.

The commission, like many others, seems to overlook the fact that there is a difference between efficiency from the standpoint of the railway manager and owner, and efficiency from the standpoint of the railway user. Unquestionably, there are many ways in which efficiency from the standpoint of the manager and the owner might be introduced without impairing the service rendered to the public. Never does a week pass when the *Railway Age Gazette* does not suggest or describe some new plan which ought to be or has been adopted to effect small or great economies. But the greatest economies that at the present time are possible are perhaps impracticable because of the opposition they would receive from the railway brotherhoods and the public.

It is seriously questionable if wages ought to be reduced to a lower basis. The wages of employees engaged in office work ought to be substantially raised. But in view of this decision of the commission, the roads should and must in the future powerfully resist demands from the railway brotherhoods for further raises in wages and modifications in conditions of employment which will tend to increase expenses. Rather, the effort must be to get more and better labor for each dollar of wages.

On the other hand, the railways ought not to take any steps that will impair the services rendered to the public. Shortcomings in and inadequacy of the service have contributed much toward creating the present hostile public sentiment towards the roads; and impairment of the service will tend to nullify all efforts that may be made to educate public sentiment on the railway question. In the long run it will be best to give the best service practicable; and if developments show that in doing so a fair profit cannot be earned without higher rates the roads should again go to the public and the Commission, and if necessary to the courts, with a demand for rate advances.

The commission in discussing the question of railway efficiency broadly intimated that owing to the dominance of the same financiers in large industrial corporations and in the railways the roads are paying higher prices than they ought to for supplies. There is no question that certain powerful combinations have been able to a large extent to dictate the prices that the railways have paid for some supplies. But this may not be due wholly, or even mainly, to the fact that the same financiers are dominant in many industrials and many railways. The roads also have had to pay in recent years much higher prices for lumber than formerly, more or less because of concerted action by the big lumber interests. Now, the controlling factors in the lumber industry are not strong factors in the railway business. The increases in railway expenses have been mainly due to the activity of monopolies in whose affairs the big financiers can scarcely be said to have much influence. These are the labor combinations.

The Commission specifically says that before the railways can be allowed to raise their rates they must show that they have exercised reasonable economies in the purchase of supplies, labor, etc. It especially disavows any intention to constitute itself the general manager of the railways. But obviously if it is going to determine the reasonableness of rates with a view to the reasonableness of the wages and prices that the railways pay for labor and supplies, it must determine whether the prices paid for supplies and the wages paid for labor are reasonable. It already controls the receipts of the railways. If it is to determine the reasonableness—in other words to control—their expenditures, also, it will be their general manager indeed. When the railway managements go into the market for supplies and labor, and the manufacturers ask excessive prices for supplies and labor asks excessive wages, they can do only one of two things. They can pay the prices and wages demanded, or they can refuse to buy the supplies and labor. A deadlock in the railway supply and labor market would mean quick deteriora-

ration, or even cessation, of the railway's service to the public. For this the public would hold the railway managers, and not the government, solely responsible. If the government is to extend its control over railway operations as far as it logically must to regulate rates on the principles apparently laid down by the Commission it should and must either step in and actively defend the roads against the exactions of excessive prices and wages, or become the nominal as well as the actual manager, and also the owner, of the properties, so that the public may hold it to a direct accountability for the results of its management. Public management and private ownership will in the long run prove incompatible.

There is one most important point about the relations between the large industrial concerns and the railways on which the commission neglected to comment. Those in control of the big industrial concerns have much oftener used their power to extort unfairly low rates than to get unfairly high prices. The consequence has been, and is, unjust discrimination. The law makes it the commission's duty to attack these discriminations. The influence of big industrial concerns in rate-making was written all over the tariffs involved in these cases. Certain of these discriminations were specifically referred to by some of the witnesses. We regret to note that while there are many criticisms of railway tariffs in the decisions, there is not one word in them about this most glaring and harmful vice in them.

* * *

Commissioner Lane in his opinion discussed at length the question of the proper basis for rate-making. Many of his criticisms of the railways for not having developed a more scientific method of cost accounting, and for having repudiated cost of service as a principle in rate-making, and having advocated the value of the service as a basis in very sweeping terms are just. The cost of the service not only ought to be, but is, a very important factor in rate-making. If rates were made regardless of cost of service they would be like postal rates—the same regardless of distance. Cost of service is recognized by traffic men not only in making the rates for different distances but in framing the classifications. Of two articles having the same value per ton, but having different bulk in proportion to their weights, every traffic man would, if other conditions permitted, put the more bulky commodity in the higher class. Railway men would do themselves more justice, and present their cases more effectively, if they would disillusionize themselves of the idea that they do not base their rates largely on cost of service and frankly admit to themselves and others that rates should be and are based, both on the cost of the service and the value of the service, the principle which governs in any particular case depending on conditions. Rates often do not depart from the cost of service basis as far as many are apt to think, nor, sometimes, as far as they ought. We are apt to say that the reason why coal is often hauled for 4 mills per ton per mile while a rate of perhaps 2½ cents per ton per mile is charged on first-class, is due to the difference in the values of the services of hauling coal and dry goods, for example. But the cost of the service of hauling a 90,000 pound carload of coal and a 15,000 pound carload of dry goods are substantially the same, and a rate of 4 mills per ton per mile on such a carload of coal and a rate of 2½ cents on such a carload of dry goods would yield almost exactly the same revenue per car per mile. Now, in this case, while the costs per 100 pounds of hauling the coal and the dry goods would be widely different, the costs per car-mile of hauling them probably would not be substantially different; and the cost per car-mile is the true unit of cost and not the cost per 100 lbs. The one rate is about 500 per cent. higher than the other, and yet on a strictly cost of service basis the difference is justifiable. Contrary to the general opinion the application of the cost of service principle to the rates for different distances probably would cause a very much greater revolution in railway tariffs than its application to rates on different commodities. Its use as the only basis of rate-making or rate regulation would

be destructive of the best interests of the railways, the shippers and the public; but its use as one of the main principles of rate-making is essential.

* * *

The practice of making many permanent improvements from earnings has been so peculiarly characteristic of the railways of the United States that it has been called the "American plan." One of the main contentions of the carriers in these cases was that this was a wise policy because it prevented the upbuilding of an excessive capitalization, and that they should be allowed to charge higher rates in order that it might be continued. The commission said that there was some merit in this contention, but it pointed out that the question whether, when earnings have been invested in the property the owners are entitled to earn a return on the part of its value thereby created, has never been settled by the courts. It cited the decision of the Supreme Court in I. C. R. R. v. I. C. C., 206 U. S. 441, in which the court said that on principle "it would seem as if expenditures for additions to construction and equipment, as expenditures for original construction and equipment, should be re-imburshed by all of the traffic they accommodated during the period of their duration, and that improvements that will last many years should not be charged wholly against the revenue of a single year." It, therefore, held, in effect, that railways should be permitted to earn only enough to pay reasonable interest and dividends and to accumulate the surpluses in fat years that will tide them over lean years; and that all permanent improvements should be made from new capital. It is a very interesting question what effect this will have on the future financial management of the railways of the United States. Between 1889 and 1909 railway capitalization in this country increased only \$11,200 per mile, or 23 per cent. This was very much less than the amount of money spent per mile on permanent improvements. If all permanent improvements are hereafter to be capitalized, increase in capitalization is apt to take place much faster in future than it has during the last two decades. The result will be to keep down the amount that the present generation must devote from earnings to permanent improvements, and, on the other hand, proportionately to increase the amount that the next generation will have to apply from earnings to interest and dividends on the new capital that must be invested in permanent improvements if they are to be made. If the change in railway policy suggested takes place, the next generation probably will regard it with less favor than the present one. We talk much in these days of the conservation of our national resources for the benefit of future generations. Evidently, some of us do not believe in the application of this principle to railway transportation.

* * *

There is a marked difference between some things that were said by many regarding the need for advances when the rate cases were pending and the comments of the same persons on the decisions of the commission. The *Railway Age Gazette* never believed that a favorable decision would raise the railways to the heights of affluence or that an unfavorable decision would reduce them to the depths of bankruptcy. We believed that advances should be granted, not because the railways were financially worse off than in many past years, but because we believed that railway rates and earnings were and had been too low on the average. When the railway business was full of speculative possibilities it was practicable, in spite of the low average return to investments in it, to get a great deal of capital which was attracted into it mainly by these speculative possibilities. Under government regulation the average return becomes of more importance because such regulation tends to eliminate the speculative possibilities. We believed that some action to increase the average rates and earnings was desirable in order adequately to stimulate improvements and new construction. The decisions do not change this opinion; they confirm it. The commission's analysis of the financial condition of the leading railways in the East and Middle West shows that even most of them are not

extremely prosperous and that those of them that recently have been making the largest expenditures for improvements and extensions are the ones most in need of larger revenues. The commission fully recognizes the need for enterprise, skill and efficiency in management. It may be that increases in traffic and better methods of management will enable the roads to increase their net earnings much more than is now generally anticipated. The commission, having recognized the need for enterprising management and having insisted that the roads must show efficiency in management before asking for higher rates, hardly can consistently, in future, if efficient management does increase net return, reduce the rates in order to reduce the net earnings merely because the shippers say the net returns are too high. Nor is it very likely that the railways themselves, under conditions which have practically eliminated competition in rates, and after having so loudly demanded higher rates, will, soon at least, make any very substantial reductions. In view of these facts it seems probable that rates in the territory from Missouri river common points to the Atlantic sea-board and north of the Ohio and Potomac rivers will not undergo any material reductions for some years to come. The main change in these rates that is to be hoped for in the near future is the elimination of the unfair discriminations in favor of certain large industries to which reference already has been made. It is questionable if this can be accomplished unless the commission is given and exercises the power to raise rates that are too low, as well as to reduce rates that are too high, and legislation giving and requiring it to exercise this power should be the next step in government regulation of railways. It is a power the possession and proper and effective exercise of which by the commission would be of more importance to the public than a physical valuation of railways.

EFFECT OF ELECTRICITY ON REINFORCED CONCRETE.

The *Revue Industrielle* reports that according to some investigations made by Dr. Rohland, who is a professor at Stuttgart, it seems that electricity has an injurious effect on reinforced concrete. The electric current serves to destroy the metal encased in the concrete. With a current intensity of 0.1 ampere continued for a few weeks, it has been possible to produce quite heavy rust deposits. It is not the occasional currents of high tension and great intensity that are to be feared, but rather the currents of low tension and weak intensity that circulate frequently and regularly through the metal. These latter quickly destroy the close adhesion of the metal to the concrete, which it may cut down to from 83 to 93 lbs. per sq. yard. Then the concrete serves no longer as a protection to the metal; the dampness and the oxygen of the air penetrate the mass, bringing about the conditions favorable to the production of rust. In order effectively to protect reinforced concrete, it is necessary to render it water-proof by coating it with a tar or asphalt paint, for dryness is the best factor for the prevention of the generation of an electric current.

Attention is also called to a curious fact cited by the *Electricien*. Reinforced concrete construction, even when not provided with a lightning rod, seems to be protected from lightning. A sufficient number of observations are not yet available to establish this hypothesis; but it also does not seem impossible that the nest of metal in reinforced concrete is amply sufficient to carry a lightning current, in case it strikes, to the ground without injury to the structure, especially if the foundation is in contact with underground water. There is no doubt that the metallic framework will then be traversed by a current, but without any great risk to the building.

Recent dispatches from Peking show that the Chinese government is anxious to complete as early as possible the Canton-Macao railway. The strategical importance of this line is thoroughly realized by the government.

DEMURRAGE COLLECTED REGARDLESS OF RAIN.

[From Statement of E. E. Mote, Manager Pacific Car Demurrage Bureau.]

In our report for November, 1910, we took occasion to refer to the heavy increase in uncollected demurrage as shown by the September reports of fourteen other demurrage bureaus which had adopted the National demurrage code and among the other causes contributing to such increase we ventured the opinion that this was partially due to the "weather rule" which makes it possible to avoid or at least defer payment by the mere claim of consignee that because of the weather he was unable to employ men or teams to load or unload, or that in process of removal to or from the car the freight would be seriously injured. As the rules of the Pacific car demurrage bureau provide that "no allowance in free time or demurrage will be made on account of weather conditions," it seems to be taken for granted by those who are not informed of the actual facts, that the climatic conditions in our territory are at all times so favorable that the removal of freight to or from the car would not be prevented on that account.

While it is true that the weather conditions with us are generally favorable throughout the greater portion of the year, it must not be understood that we are entirely free from rain or snowfall. Our rainfall during two or three months is sufficient to last the entire year, and when it *does* rain, the windows of the heavens are opened.

The rainfall in San Francisco during the month of January, 1911, according to the official reports of the Weather Bureau was 13.79 inches or 2.51 inches greater than the heaviest rainfall at Chicago in any single month during the last forty years.

That the rainfall in San Francisco was not permitted to interfere with "the removal of freight to or from the car" and that our consignees did not use the pretext that it would be seriously damaged if so removed is indicated by the fact that but one car out of a hundred subject to the \$6 demurrage rate was held overtime, this being with a single exception the lowest percentage of cars held overtime in any month since June, 1909. The percentage of \$1 cars held overtime was 9.35, that being precisely the monthly average on such cars during the past nineteen months. During the time in which we made allowances for weather conditions 20 per cent. of the entire amount refunded was in settlement of weather claims. This only goes to show that in placing the full responsibility for prompt removal of freight with the consignee, he may be depended upon to adopt the means necessary to that end, and our own observation and experience has been that no particular hardship has resulted either in exposure of men and teams or damage to freight while being removed.

FOREIGN RAILWAY NOTES.

The formal opening of the Rosario and Puerto Belgrano Railway, Argentina, took place on December 15, 1910. This line was built by a French company under a concession from the federal government. It traverses the provinces of Santa Fe and Buenos Aires, between the points named, a distance of approximately 490 miles, and passes through a fertile agricultural region.

There was recently a change in the Austrian cabinet, in consequence of an adverse vote in parliament, and among those retiring was the railway minister, Wrba, who had been for more than forty years in the service of government in connection with railway affairs and who had much to do with the measures which have recently brought the principal lines in the country into the state system. He is succeeded by Dr. Glombinski, who for most of his life has been professor of political economy in the University of Lemberg, but who has been also an active member of parliament for 18 years. Dr. Glombinski is well known for his works on economics and finance, published originally in the Polish language.

General News Section.

The Lehigh Valley has increased the pay of its firemen, the increase taking effect March 1.

At Gainesville, Ga., March 3, three train robbers were sentenced to imprisonment for 20 years, 15 years and 15 years each, for robbing the express car of a train on the Southern Railway a few weeks ago.

Sir Thomas Rees Price, Commissioner of the South African railways, arrived in New York this week, on a visit to America for the purpose of studying the railways of the country on behalf of the South African government.

Annual card passes are to be issued by the Baltimore & Ohio to all freight and ticket agents who have been in its service for three years or more. The passes will be good over the division on which the recipient is employed.

On Sunday last Lieut. Bague in a Bleriot monoplane flew from Antibes, near Nice, France, over the Mediterranean sea, to the Island of Gorgona, off the coast of Italy, 125 miles, the longest flight ever made entirely over water. Lieut. Bague was not accompanied by any boat.

The pay of track men on the Canadian Pacific has been increased from 12½ per cent., and on some divisions 15 per cent., as a result of the decision of a Board of Conciliation. According to a press dispatch from Winnipeg, the rates now adopted by the Canadian Pacific will also be adopted by the Canadian Northern.

In a flight from St. Cloud, near Paris, France, to Puy-de-Dome, last Tuesday, Eugene Renaux, carrying a passenger, made the distance of 217 miles in five hours and eight minutes, and won a prize of \$20,000. Puy-de-Dome is 4,800 ft. above the level of the sea. Renaux made a stop of 17 minutes at Nevers. He used a Farman biplane.

Professor H. C. Adams was the last witness before the railway securities commission, of which President Hadley is chairman, at the last public meeting which was held in New York March 7. There will be no further formal public meetings of the commission, but the definite recommendations of the full report will not be made for some time.

The Chateau Laurier which is being built by the Grand Trunk Railway at Ottawa and which will be opened next Autumn, will be one of the finest railway hotels in the world. The naked shell now completed cost over \$1,000,000 and it is expected that another million will be expended in decorations and furnishings and on the grounds. The same company is building a magnificent union station at Ottawa.

The committee on railroads of the Illinois house of representatives has reported favorably a full crew bill, and vigorous arguments for and against the bill were made before the committee by representatives of the labor brotherhoods on the one hand and the general managers of the railways on the other. A full-crew bill has been the subject of hearings before a legislative committee at Albany, N. Y.

In 1910 there was a total number of tickets sold on the New York subway of 270,221,490, as compared with 256,768,981 in 1909 and 220,991,212 in 1908. Of the total number of tickets sold, 12.4 per cent. were sold at Brooklyn stations in 1910, 11.08 in 1909 and about 10 per cent. in 1908. The first station in Brooklyn (Borough Hall) was opened in January, 1908; three more stations in May, 1908.

The Chicago, Rock Island & Pacific has appointed a committee on "Office Methods and Practices," with the object of investigating the methods in use in various company offices and if possible determining the standards to govern this work. The committee includes LeRoy Kramer, assistant to second vice-president, chairman; F. D. Reed, assistant to vice-president; L. K. Luff, auditor of disbursements; E. S. Gentle, district accountant, and F. J. Easley, superintendent.

On the Pennsylvania Railroad last year 228 lectures on First Aid to the Injured were given to the employees, and about 7,000 men listened to them. This year it is intended to do even more in this direction. As a supplement to the lectures there has been

printed a pocket card, containing in brief language the main points to be remembered in cases of hemorrhage, fracture, burns, shock, fits and sunstroke. The lectures now deal fully with the methods to be used for resuscitation from electric shock.

The Sundry Civil Appropriation bill passed by Congress last week includes a provision authorizing the president to designate any member of the Interstate Commerce Commission, or of the Court of Commerce, to exercise the power and duties of a member of Boards of Conciliation in railway labor disputes, the power and duties heretofore devolving by law exclusively on the chairman of the Interstate Commerce Commission (acting in conjunction with Dr. Neill of the Department of Commerce and Labor).

Acting under this law, President Taft has designated Judge Knapp, chief judge of the Commerce Court, to perform the functions indicated. Representatives of railways or of employees who desire to take advantage of the Erdman law providing for conciliation will therefore have the same men to deal with in the future as in the past, Messrs. Knapp and Neill.

The Secretary of War has decided to permit the construction of a temporary extension to one of the Chelsea piers, New York City, for the benefit of the White Star Line, which this summer will put into commission two steamships each 882 ft. long. The steamship people, and others interested, appealed to the secretary from the decision of the Board of Engineers, who had refused to recommend an extension of the piers, and he gave them a hearing on Monday last. The extension will consist simply of clusters of wooden piles of sufficient size and stability to protect a vessel lying at the dock from being struck by others moving up or down the river; and after the War Department, in conjunction with the Governors of New York and New Jersey, has agreed on a permanent plan for the accommodation of long vessels in some other place, the Chelsea extension will be removed.

New Railway Laws in Indiana.

The new block signal law of Indiana is noticed in the editorial columns. There has been passed in that state also a law providing for the appointment by the Railway Commission of a locomotive boiler inspector at a salary of \$2,000, and one forbidding the use of cabooses less than 24 feet long. The date set for complete compliance with the caboose law is January 1, 1914.

Howard Elliott Not to Head Missouri Pacific.

Despatches from St. Louis stating that Howard Elliott has refused the presidency of the Missouri Pacific have been confirmed by Kuhn, Loeb & Co., New York. Mr. Elliott's refusal was based on his failure to secure the consent of George F. Baker and other Northern Pacific people who have stood back of him since he assumed the presidency of the Northern Pacific. Mr. Elliott did not wish to leave the Northern Pacific against the wishes of these men. So far as he is concerned the matter is, therefore, closed.

Mail Car Requirements.

The law designed to compel the use of stronger mail cars, as passed by Congress last week, to go into effect July 1 next, is as follows:

. . . That no part of the [appropriation for mail cars] shall be paid for the use of any car which is not sound in material and construction, and which is not equipped with sanitary drinking water containers and toilet facilities, nor unless such car is regularly and thoroughly cleaned: Provided further that after the first of July, nineteen hundred and eleven, no pay shall be allowed for the use of any wooden full railway post-office car unless constructed substantially in accordance with the most approved plans and specifications of the Post Office Department for such type of cars, nor for any wooden full railway Post-office car run in any train between adjoining steel cars or between the engine and a steel car adjoining, and that hereafter additional cars accepted for this service shall be of steel, or with steel underframe, if used in a train in which a majority of the

cars are of like construction: Provided further, That after the first of July, nineteen hundred and sixteen, the Postmaster General shall not approve or allow to be used or pay for any full railway post-office car not constructed of steel or with steel underframe, if such post-office car is used in a train in which a majority of the cars are of steel or of steel underframe construction.

Wages Increased on Wabash.

After conferences lasting about two months, the Wabash has made settlements regarding wages with its enginemen and trainmen west of Chicago and Tilton; and also with trainmen east of these points, where the enginemen already were being paid according to the western scale. West of Chicago and Tilton the advance for both classes is 10 per cent., taking effect March 1. These rates will conform to the scale which was agreed to by the other western roads on the first of last January. East of Tilton and Chicago the trainmen receive an advance of 6 per cent., bringing their wages up to the level of the rates paid by the Pennsylvania Lines and the New York Central; and the men are promised that on July 1, 1912, the Wabash will pay the same rates in this territory as on its western lines. The enginemen and trainmen employed by the Wabash on its trains running over the Grand Trunk between Detroit and Buffalo will have, after January 1, 1912, the scale which has been agreed to in that territory by the Grand Trunk, namely, the Canadian Pacific scale. The advances now granted by the Wabash will increase its pay rolls \$350,000 annually. The men had demanded that all of the increases above noted should be granted at once, but finally consented to the deferred dates. This change in dates makes the burden on the company about \$60,000 less than it would have been otherwise.

Gasolene Passenger Cars on the Ann Arbor.

The Ann Arbor Railroad has bought five McKeen gasolene motor cars, to be run on certain light runs, in place of regular passenger trains. The cars are 70 ft. long and 200 h. p. each. It is intended to run these cars on schedules which will permit them to stop at highway crossings, the aim being to afford passengers the same accommodations that they get on interurban electric lines.

Steel Corporation's Share in Total Output of Iron and Steel.

Notwithstanding the hundreds of millions of dollars the United States Steel Corporation has spent for new construction and the acquisition of new properties, its relative position from the point of production of steel to the country's total output is not as strong as it was at the time of organization. The Steel Corporation has increased its capacity in the neighborhood of 75 per cent. since organization, but its competitors appear to have made even heavier gains. The following table gives the Steel Corporation's per cent. output of pig iron, steel ingots and steel rails in 1901, 1908 and 1910, compared with the country's total percentage output of similar products:

Pig Iron:

	1910. Per cent.	1908. Per cent.	1901. Per cent.
Produced by U. S. Steel.....	43.2	43.5	43.2
Produced by other manufacturers..	56.8	56.5	56.8

Steel Ingots:

	1910. Per cent.	1908. Per cent.	1901. Per cent.
Produced by U. S. Steel.....	56	56.4	66.2
Produced by other manufacturers..	*44	43.6	33.8

Steel Rails:

	1910. Per cent.	1908. Per cent.	1902. Per cent.
Produced by U. S. Steel.....	57.9	54.7	64.8
Produced by other manufacturers..	42.1	45.3	35.2
	100.0	100.0	100.0

*Estimated.

If the furnaces and mills were allowed to operate fully, the United States Steel Corporation could turn out annually close to 14,500,000 tons of pig iron, between 17,000,000 and 18,000,000 tons of ingots, between 3,000,000 and 3,500,000 tons of rails, and 13,500,000 tons of finished steel "for sale." It would be difficult to make comparisons based on actual capacity. It has been stated that the country is in a position to turn out at least

35,000,000 tons of pig iron if the furnaces were able to operate full for 12 months. The Steel Corporation's 14,500,000 tons would, therefore, represent about 41 per cent. of the country's maximum capacity. The Steel Corporation's ingot capacity is greatly in excess of its pig iron capacity. The following table shows the production of certain classes of iron and steel of the United States Steel Corporation from 1902 to 1910, inclusive, in tons:

	Pig Iron.	Steel Ingots.	Steel Rails.	Finished Steel.
1910.....	11,800,000	14,150,000	2,100,000	*11,100,000
1909.....	11,618,350	13,355,189	1,719,486	9,859,660
1908.....	6,934,408	7,838,713	1,050,389	6,206,932
1907.....	10,819,968	13,099,548	1,733,814	10,376,742
1906.....	11,267,377	13,511,149	1,982,042	10,578,433
1905.....	10,172,148	11,995,239	1,727,055	9,226,386
1904.....	7,369,421	8,406,378	1,242,646	6,792,780
1903.....	7,279,241	9,167,960	1,934,315	7,635,690
1902.....	7,975,530	9,743,918	1,920,786	8,197,232

*Estimated.

New steel construction over the last five years was more pronounced than in the preceding five years. The Steel Corporation, as well as the independents, have been aggressive in this direction, but it is believed that extensions will be limited over the next five-year period. This will be due to the fact that the country's steel capacity is now believed to be in excess of actual consumptive requirements. The corporation has been spending at the rate of about \$40,000,000 a year for new construction for five years back and relatively heavy expenditures have been made by the independents.—Abstracted from an article in the *Wall Street Journal*.

New York Railroad Club.

The next regular meeting of the New York Railroad Club will be held on March 17 at the building of the United Engineering Societies, New York. The Committee on Electrification which expected to make a formal report has decided not to do so as it finds that the one made a year ago represents the situation up to date. It has, however, arranged for short addresses by a number of recognized experts and authorities, including the following: Prof. George F. Swain, of Boston, Mass.; Samuel M. Vauclain, of the Baldwin Locomotive Works, Philadelphia, Pa.; C. L. Bardo, superintendent electric division, N. Y. C. & H. R.; H. Gilliam, electrical superintendent, N. Y., N. H. & H.; and William McClellan. Invitations have also been extended to and affirmative replies hoped for from J. R. C. Armstrong, H. G. Stott, W. B. Potter, A. J. Armstrong, L. B. Stillwell, W. S. Murray, E. W. Rice, Thomas F. Mullaney, and Frank J. Sprague.

American Society of Mechanical Engineers.

At the meeting of the American Society of Mechanical Engineers co-operating with the American Institute of Electrical Engineers, to be held on March 10, at the United Engineering Societies building, New York, the topic for discussion will be The Cost of Power Generation. Representatives of the large power stations, small isolated plants, and the public service commissions will discuss the question and present figures of actual costs of power production.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.; annual convention, May 23-26, Chicago.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting, June 22, 1911, Niagara Falls, N. Y.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn., Sept. 19, 1911.

AMERICAN ASSOCIATION OF LOCAL FREIGHT AGENTS.—R. O. Wells, East St. Louis, Mo.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and September.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 17, New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichy, C. & N. W., Chicago; next meeting, March 22, Chicago.

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION.—E. H. Fritch, Monadnock building, Chicago; March 21-23, 1911, Chicago.

AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 9, 1911, Detroit, Mich.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 14-16, 1911, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wednesdays, except June and August, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York; 3d Tuesday of each month, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York; next convention, May 30-June 2, Pittsburgh, Pa.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911, New Orleans, La.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911, Montreal, Can.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W. Ry., Chicago; semi-annual, June, Washington, D. C.; annual, November, Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911, Boston, Mass.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, New York; June 20-21, 1911, Cape May City, N. J.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tuesday in month, except June, July and Aug., Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; annual, October 9, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug., St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Waren P. Taylor, Richmond, Va.; June 21, St. Paul, Minn.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—H. D. Judson, 209 East Adams St., Chicago; Wednesday preceding 3d Thursday, Chicago; annual, July 29, Chicago.

INDIANAPOLIS RAILWAY AND MECHANICAL CLUB.—B. S. Downey, C. H. & D., Indianapolis, Ind.

INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18, 1911, Chattanooga, Tenn.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.; next convention July 25-27, Chicago.

INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.

IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August, Des Moines.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 19-21, 1911, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.; Sept. 12-15, 1911, Atlantic City, N. J.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept., Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August, New York.

NORTHERN RAILWAY CLUB.—C. L. Kennedy, C. M. & St. P.; 4th Saturday, Richmond, Va.; 20th annual, June 21, 1911, St. Paul, Minn.

OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; second Wed.

RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City, Mo.; 3d Friday in month, Kansas City.

RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa.; 4th Friday in month, except June, July and August, Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.; March 20, Chicago; annual, Oct. 10, Colorado Springs, Colo.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; annual, May 22-24, 1911, Milwaukee, Wis.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct. 1911, St. Louis.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug., St. Louis; annual, Oct. 20, Atlanta.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Sept. 12-14, St. Paul, Minn.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.; semi-annual, April 20, Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Prudential bldg., Atlanta, Ga.; 3d Thurs., Jan., April, August and Nov., Atlanta.

TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo, Ohio; 1st Saturday; annual, May 6, 1911, Toledo.

TRAFFIC CLUB OF CHICAGO.—Guy S. McCabe, La Salle Hotel, Chicago; meetings monthly, Chicago.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August, New York.

TRAFFIC CLUB OF PITTSBURGH.—T. J. Walters, Oliver building, Pittsburgh, Pa.; meetings monthly, Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911, Baltimore, Md.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 11, 1911.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.; annual, August, 1911, Chicago.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August; annual, May 8, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August, Chicago.

WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, First National Bank bldg., Chicago.

Traffic News.

The Canadian Pacific will this spring start 50 towns on the lines of its branch railways in Saskatchewan and Alberta, which were built last fall.

The trunk lines, like the roads west of Chicago, have decided to comply with the requirements of the recent decision of the Interstate Commerce Commission, and withdraw all propositions to increase freight rates.

The Delaware, Lackawanna & Western has withdrawn from the agreement under which the railways leading west from New York City pool the immigrant traffic to western points, and there is much talk of a possible disruption of the pool and consequent cutting of rates.

The package express service from Philadelphia to suburban points on the Philadelphia & Reading, which has been handled for the past twenty-two years by the United States Express Company, will be transferred to the direct control of the railway April 1. The tariffs now in force will be little changed, but the radius of territory to which the package rates will apply has been extended to include 300 stations in all, an increase of about thirty stations.

The Western Passenger Association lines have decided to adopt the uniform baggage rules, making them effective May 1. Under these rules an extra charge will be made for the transportation of any trunk or other piece of baggage whose greatest dimension exceeds 40 in., the extra charge for each additional inch to be equal to the charge for 10 lbs. excess baggage.

The Railway Business Association has published in its Bulletin number 6 a story of the freight rate advance cases, written by its secretary, Frank W. Noxon, under the title "The Rate Decision and Railway Credit." Mr. Noxon's review of the cases was intended to be entertaining as well as instructive, and it is both to a marked degree. It is an unbiased and very interesting abstract of and commentary for the testimony and the decisions.

The Chesapeake & Ohio is understood to have made a contract, running about two years, under which coal from mines on the line of the Chesapeake & Ohio, destined for Lake Erie, will be carried over the Norfolk & Western, from Kenoova to Columbus. From Columbus the coal will go by the Hocking Valley. This arrangement will probably continue until the Hocking Valley shall have been double-tracked, so as to be able to take these shipments direct from the Chesapeake & Ohio.

Railway officers in Chicago have been advised that the Interstate Commerce Commission has changed its ruling regarding the issuance of free or reduced transportation to employees on private or special cars which are not the property of the common carriers. The commission held in a former ruling that free or reduced transportation could not in such cases be given. It has more recently ruled that where the employees are necessary to the operation of these cars they may be regarded as train employees.

For about a year Mr. Anderson, of the National Claims Bureau, New York, and R. J. Donovan, also of New York, have been engaged in a suit before the Interstate Commerce Commission endeavoring to get lower express rates to and from England. The commission has ordered a reduction of 25 per cent. to and from New York and Brockton, Mass., Whitman, Taunton, etc., effective February 6, applying, however, only on boat and rail line shipments. The rate was formerly \$1 per 100 lbs. by rail, or rail and water. To secure the reduced rate of 75 cents, packages must be marked "boat and rail."

Complying with an order of the New Jersey Public Utilities Commission, the Pennsylvania Railroad has reported relative to passenger train service on the New York division, answering a complaint that local trains were retarded through discrimination in favor of express trains for the month of February, the records show that of the 2,499 trains arriving at Jersey City 92 per cent. made the schedule. Forty of those late were express and sixty-eight were local trains. Thirty-one locals were de-

layed because the right of way was given to through trains. The longest delay was 12 minutes; there were two delays of 10 minutes, and the others averaged about 5 minutes.

Commissioner Clark of the Interstate Commerce Commission took testimony at Chicago last week in the case brought by T. H. Sinclair & Company, meat packers at Cedar Rapids, Iowa, in which it is alleged that the railways discriminate against this concern in favor of the large meat packers in the rates on dressed meats. Sidney E. Sinclair, president of the company, in his testimony pointed out that while the rate on dressed meat from Omaha, Neb., and St. Joseph, Mo., to Chicago is 23½ cents per 100 lbs., this company has to pay 11 cents per 100 lbs. to transport live hogs to its plant at Cedar Rapids and a rate of 13½ cents per 100 lbs. on the dressed product to Chicago, a total of 24½ cents.

Walter E. McCormick, attorney for ten independent salt companies, has forwarded a petition to the Interstate Commerce Commission alleging that 175 railways are giving excessive divisions of through rates to the Michigan, Indiana & Illinois steamship line, which is controlled by the Morton Salt Company and to the Ludington Transportation Company, controlled by the Stearns Salt and Lumber Company of Ludington, Mich. It is alleged that the control of these boat lines by the large salt companies makes these excessive divisions equivalent to rebates to the controlling companies. The case is really one between the independent and the large salt companies, as many railway men concede that the allowances given are excessive.

Traffic Club of Chicago.

The Traffic Club of Chicago will hold its annual meeting at the La Salle Hotel on March 28, when the election of officers for the ensuing year will take place. The nominating committee suggests the following names: For president, Frank P. Eyman (Chicago & North Western); first vice-president, F. B. Montgomery (International Harvester Co.); second vice-president, V. D. Fort (Illinois Central); third vice-president, W. D. Hurlbut (Wisconsin Pulp & Paper Mfg. Co.); secretary, Guy S. McCabe (Pennsylvania Co.); treasurer, John H. Grace (Great Northern); directors for two years, John T. Stockton (Jos. Stockton Transfer Co.); L. T. Jamme (Union Transfer Co.), W. J. Lynch (New York Central), L. Richards (Quaker Oats Co.).

Special Tourist Car Trains on Union Pacific.

The Union Pacific will run special trains composed of tourist cars from Omaha to the Pacific coast on March 11, 12 and 13, and April 8, 9 10 and 11, for the accommodation of colonist traffic. The tourist cars will originate on the Chicago & North Western, the Chicago, Milwaukee & St. Paul, the Chicago Great Western, and the Illinois Central, mainly at Chicago. They will leave Chicago on various trains on these roads the day before they are to be taken out of Omaha by the Union Pacific. Usually during the first few days of the period during which colonist rates to the Pacific coast have been in effect, the Union Pacific has had to handle a large number of tourist cars on its various trains. It was decided that it would be more economical for the road and more satisfactory to its patrons if these cars were consolidated into solid trains and run through on fast schedules. The schedule will be eight hours faster than tourist service previously afforded. The trains will leave Omaha at about 5 p. m., and will be en route two days and three nights, arriving at San Francisco at 8 a. m. on the third day, at Los Angeles at 2:30 p. m. of the third day, and at Portland at 11:15 a. m. of the third day. It would be practicable to make the run in two days and two nights, but it is felt that this would not be satisfactory to the travelers, in as much as it would land them in San Francisco and Portland at night.

It was originally planned to put lunch or cafeteria cars in service on the Union Pacific for the accommodation of the tourist-car passengers, but the cars could not be got ready in time, and, in consequence, each of these special tourist trains will have a dining car in which meals will be served at popular prices. A meal consisting of ham, or bacon and eggs, potatoes, butter and bread will be served for 30 cents.

If passengers choose to carry their own provisions, they may get to use with them coffee, fruit, etc., in the dining cars at low prices. The railway rates charged on these trains will be the regular colonist rates of \$33 from Chicago, \$32 from St. Louis, and \$25 from Omaha, and the tourist sleeping car rates will be the usual rates of \$7 from Chicago, \$6.50 from St. Louis, and \$5.75 from Omaha.

President Finley Before the Richmond Chamber of Commerce.

Believing that the highest degree of prosperity can be brought to the south by a full utilization of southern resources, it is the policy of the management of the Southern Railway Company to encourage, in every way that it properly can, diversification in agriculture and in manufacturing. Bearing in mind that the south has a great economic advantage in its practical monopoly of producing the cotton supply of the world, the management of the company is co-operating with the United States Agricultural Department and the agricultural authorities of the several states to encourage the more general adoption of those methods of growing cotton which will result in larger average yields per acre. The effect of this will be to enable our section to supply the increasing demand of the world for cotton, and, at the same time, permit our farmers to devote part of their lands to other crops, particularly corn, and to live stock growing.

The industrial development of the south is being built up on the solid foundation of the manufacturing of southern raw materials. Formerly by far the greater proportion of such materials were shipped out of our section to become the basis of profitable industries elsewhere. To a constantly greater extent are now being put through at least the first processes of manufacture in the south, and our people are adding the profits of these industries to the profits of producing the raw materials. The next great step forward, and one which the management of the company is constantly urging upon the southern people, is the more general development of secondary industries which will use as their raw materials the products of the primary industries of the south.

Notwithstanding the great progress that has been made in recent years in the use of structural steel and of reinforced concrete, the demand for forest products in the United States still continues at a rate in excess of the annual growth of our forests. It follows that any state having considerable areas of timber lands possesses a natural resource of great and constantly increasing value. A practical problem confronting the people of such a state is that of so using this resource as to obtain the greatest benefits from it. In the European countries it has been demonstrated that forest lands can be made the sources of continued income, and, at the same time, be preserved as sources of wealth for future generations. I believe the same results can be accomplished in the United States, and that the owners of considerable tracts of wood lands will find it profitable to practice forest conservation by cutting only the mature timber and insuring a constant re-production of the more valuable species.

Consideration of the relation of the Southern Railway Company to Virginia should not be narrowed to its relation as a carrier only of those things that are produced and also consumed within the state. In measuring its relations to Virginia it should always be kept in mind that it furnishes a highway, by means of direct transportation over its own rails, to the wide markets of the south for the agricultural, industrial, and commercial interests of your state. It brings to your manufacturers the raw materials of other states. Through the extensive industrial development on its lines in this and other States it furnishes a market for a large proportion of the coal mined on the lines of other railways in Virginia. Furthermore, through its direct touch with the coal development of southwestern Virginia, it markets the production of the operators in that region in connection with the steam and domestic requirements of the south and also will afford them an opportunity for export shipments.

The Southern Railway Company is a citizen of Virginia. As a citizen, owning, maintaining, and operating a great property employed in a public service, it is vitally interested in the governmental policies of the state. While abstaining from political activities, in the sense of securing, or endeav-

oring to secure, the success of men or of parties, it is nevertheless its right, as a citizen and a property owner, to be heard in argument or in protest before the bar of public opinion on all matters affecting its interests and its public relations. It stands before the law on an equal footing with every other citizen of Virginia, and is entitled to the same protection by the law and by public opinion that is accorded to all its fellow citizens. I have no fear that the enlightened public opinion of Virginia will not always recognize this.

As a result of the intimate relations between the interests of the people of the state and the interests of its railways, and of the degree to which these relations may be affected beneficially or injuriously by governmental policies, it is of the highest importance that railway officials and employees on the one hand, and the general public on the other hand, should understand the economic principles underlying these relations. For this reason I believe that those of us who are engaged in the management and operation of the railways of the United States should study these matters closely and should embrace every proper opportunity to present the case of the railways to our fellow citizens. We may do so, I believe, with full confidence in the fairness and justice of the American people and with the assurance that the ultimate effect of those policies which are fair and just to the railways and which encourage investments in railway enterprises will be beneficial to all of the people. As a result of the general discussion of these matters within the past few years, they are already coming to be better understood, and I believe that, in our section, at least, we may look forward to an era in which the railways and the people, working together in harmonious co-operation, will unite in the upbuilding of a greater and more prosperous south.

Crop Indications.

The crop reporting board of the Department of Agriculture estimates that the quantity of wheat on farms, March 1, 1911, was about 179,690,000 bushels, or 25.8 per cent. of the 1910 crop, against 173,344,000 bushels, or 23.5 per cent., of the 1909 crop on farms March 1, 1910, and 154,031,000 bushels, or 23.3 per cent., the average for the past ten years. About 54.5 per cent. of the crop will be shipped out of the counties where grown, against 59.3 per cent. of the 1909 crop, and 57.0 per cent., the average of the past ten years so shipped.

The quantity of corn on farms March 1, 1911, was about 1,265,634,000 bushels, or 40.5 per cent. of the 1910 crop, against 1,050,865,000 bushels, or 37.9 per cent., of the 1909 crop on farms March 1, 1910, and 953,100,000 bushels, or 38.3 per cent., the average for the past ten years. About 22.2 per cent. of the crop will be shipped out of the counties where grown, against 23.1 per cent. of the 1909 crop and 20.7 per cent., the ten-year average so shipped. The proportion of the total 1910 crop which is merchantable is about 86.4 per cent., against 82.6 per cent. of the 1909 crop and 83.6 per cent., the ten-year average.

The quantity of oats on farms March 1, 1911, was about 421,535,000 bushels, or 37.4 per cent. of the 1910 crop, against 363,159,000 bushels, or 36.1 per cent., of the 1909 crop on farms March 1, 1910, and 317,985,000 bushels, or 36.4 per cent., the average for the past ten years. About 31.2 per cent. of the crop will be shipped out of the counties where grown, against 32.7 per cent. of the 1909 crop, and 28.1 per cent., the ten-year average.

The quantity of barley on farms March 1, 1911, was about 31,062,000 bushels, or 19.1 per cent. of the 1910 crop, against 41,220,000 bushels, or 24.2 per cent., of the 1909 crop on farms March 1, 1910. About 50.4 per cent. will be shipped out of the counties where grown, against 51.7 per cent. of the 1909 crop.

INTERSTATE COMMERCE COMMISSION.

The commission has suspended tariffs presented by the Chicago & Alton, naming allowances to be granted to the Manufacturers Railroad of St. Louis. The allowances were to have gone into effect on March 17, but are now suspended until May 1, pending an investigation.

The commission has announced that applicants for relief from the long and short haul provision of the Interstate Commerce law—the fourth section—as regards passenger fares must if

possible relieve the situation themselves by readjustment of tariffs. In order to give the carriers ample time to make the suggested readjustments, the commission orders:

First—That not later than July 1, 1911, all carriers must have on file tariffs of fares between points upon their individual lines which observe the rule of the fourth section, except in so far as a departure has been authorized by specific orders of the commission. In all cases where the carrier intends to insist upon charging a fare in disregard of the rule of the fourth section it must, by April 1, 1911, file with the commission a written statement, pointing out the specific fares upon which it will insist, or it may file a new application covering only these fares.

Second—Not later than December 1, 1911, all carriers must have on file joint passenger tariffs which observe the rule of the fourth section, except as relieved by specific orders of the commission, in case of all fares within the several passenger [association] territories. If carriers intend to insist upon maintaining joint fares within these territories which disregard the rule of the fourth section, they must, on or before May 1, 1911, file a statement, etc.

Third—On March 1, 1912, all the passenger tariffs, both joint and individual, of all carriers on file or in effect must observe the rule of the fourth section, except as relief has been granted by specific orders of the commission. If any carriers intend to insist, etc., they must by June 1, 1911, file with the commission a statement, etc.

Demurrage Charges Reasonable.

Riverside Mills v. Charleston & Western Carolina et al. Opinion by the commission:

On account of damage to complainant's mill and stock, occasioned by flood, complainant was unable to receive and unload promptly inbound shipments, although carriers were in a position to make deliveries. Nevertheless, the assessment of demurrage charges was not unreasonable. (20 I. C. C. 153.)

Exception to Cheapest Route Ruling.

Crescent Lumber Co. v. Illinois Central et al. Opinion by the Commission:

Two routes, over which the same rate applied, were available from points of origin to destination. Over one of said routes reconsignment in transit was permitted by proper tariff publication, but such reconsignment was not permitted over the other route. In the absence of routing instructions by the shipper, or notice that its shipments were to be reconsigned in transit, the initial carrier is not liable in damages for failure to forward the traffic over the route via which the reconsignment privilege was available. (20 I. C. C. 228.)

The Sugar Lighterage Question at New York Settled.

Federal Sugar Refining Co. v. Baltimore & Ohio et al. Opinion by Commissioner Harlan:

A carrier is not warranted under section 15 of the act in making an allowance to one shipper who provides a facility and performs a service in the transportation of his own property, while refusing a similar allowance to another shipper, competing in the same markets and in the same line of business, who provides a similar facility and performs the same service in the transportation of his property. The allowances paid by the defendants on the sugar brought by Arbuckle Brothers on floats and lighters to their regular freight stations on the Jersey shore, no allowances being paid to complainant on sugar brought by it on lighters to the same stations, result in inequalities, preferences, and discriminations and are unduly prejudicial to the complainant as a shipper over the defendants' lines in competition with Arbuckle Brothers in the same markets. The fact that Arbuckle Brothers operate their dock in Brooklyn as a terminal for the defendants does not justify an allowance to them for lighterage their sugar to the regular stations of the defendants on the Jersey shore so long as an allowance to the complainant for lighterage its sugar to the same stations from Pier 24 is refused. A receiving station operated for carriers by a competitor in the same line of business is not a reasonable facility of transportation to offer a shipper. (20 I. C. C. 200.)

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF DECEMBER, 1910. (SEE ALSO ISSUES FEBRUARY 10, 17, 24 AND MARCH 3.)

Name of road.	Mileage operated at end of period.	Operating revenues			Maintenance			Operating expenses			Net operating revenue (or deficit).	Outside operations, net.	Operating income (or loss).	Taxes.	Increase (or decrease) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Way and Of equipment.	Traffic.	Transportation.	General.	Total.	Trans-					
Atlanta & West Point.....	93	\$5,395,596	\$44,151	\$113,239	\$10,922	\$17,317	\$4,804	\$4,964	\$70,245	\$42,994	\$5,672	\$7,252	\$9,309	\$24,632	
Atlanta & St. Lawrence.....	167	109,177	23,008	142,522	15,034	32,063	4,651	64,549	121,570	20,952	8,452	12,500	21,061	364	
Atlantic City.....	167	5,327	40,006	101,784	27,155	14,288	1,285	67,433	110,842	29,058	2,600	27,354	—	—	
Buffalo & Susquehanna R. R.	265	139,691	9,338	154,577	22,647	32,394	6,866	61,805	5,911	124,633	—	—	—	—	
Buffalo & Susquehanna Ry.....	91	35,862	6,935	44,607	5,577	29,156	5,80	24,202	2,450	77,358	—	—	—	—	
Butte, Anaconda & Pacific.....	46	75,781	6,092	87,471	6,075	20,366	4,941	2,932	79,371	6,017	1,614	6,454	—	—	
Chicago, Peoria & St. Louis.....	255	115,105	23,471	145,408	20,661	37,614	7,137	78,491	6,017	149,920	4,500	9,012	24,486	—	
Cincinnati & Muskingum Valley.....	148	70,883	19,324	96,241	12,591	12,73	1,803	5,539	1,529	66,825	29,416	6,190	23,226	—	
Cincinnati Northern.....	246	83,567	17,111	106,942	12,525	12,93	3,960	44,166	86,451	6,605	13,886	6,190	11,425	—	
Denver, Northwestern & Pacific.....	215	64,121	11,930	80,651	12,043	12,888	3,966	3,907	63,330	17,321	3,000	14,321	13,173	—	
Detroit & Mackinac.....	360	56,353	26,297	88,715	7,985	21,694	6,788	50,873	31,138	62,659	26,966	6,676	20,836	—	
Detroit, Grand Haven & Milwaukee.....	191	124,611	42,371	190,635	20,055	41,852	5,227	40,212	40,212	45,173	3,009	4,2590	10,040	—	
Duluth & Iron Range & Northern.....	293	95,210	31,192	136,509	50,444	82,852	1,773	69,138	35,998	86,016	20,064	3,915	153,235	14,241	
Duluth, Missabe & Northern.....	200	67,163	40,343	125,845	16,648	82,852	1,773	67,205	2,480	86,378	42,009	80,642	31,279	176,181	
Fort Worth & Rio Grande.....	196	125,097	12,580	131,153	97,307	14,736	10,938	50,129	50,129	82,924	50,567	4,094	13,967	8,281	
Houston East & West Texas.....	191	83,991	35,132	125,598	12,525	21,235	3,948	14,295	14,295	77,745	47,553	4,459	12,028	—	
Indianapolis Southern.....	179	80,087	19,665	103,305	15,035	15,360	2,070	43,661	1,788	77,934	25,371	4,000	21,371	—	
Ledger & Hudson River.....	96	120,259	35,563	141,414	11,852	12,526	2,650	43,101	4,101	81,824	2,825	3,100	4,490	9,576	
Louisiana & Arkansas.....	255*	98,190	19,607	125,256	15,704	16,684	2,509	34,162	4,800	73,595	48,667	2,825	45,842	6,025	
Louisville, Henderson & St. Louis.....	200	67,163	32,899	107,016	22,108	21,726	2,918	21,727	2,537	86,016	21,000	2,667	18,574	13,858	
Midland Valley.....	324	82,163	40,343	128,387	21,874	16,305	2,480	35,047	10,663	86,016	11,138	4,230	42,300	5,732	
Nevada Northern.....	165	125,097	12,580	141,586	15,104	10,913	4,265	30,564	13,720	86,016	29,991	1,611	31,602	13,369	
New York, Chicago & St. Louis.....	565	83,875	113,659	99,000	116,075	12,043	10,938	43,086	12,043	71,402	27,938	2,159	26,419	7,201	
Pecos & Northern Texas.....	296†	110,632	33,137	148,950	19,142	27,596	2,361	44,710	4,452	98,281	30,689	4,000	21,371	—	
Pittsburgh, Shawnee & Northern.....	240	108,832	38,393	119,072	12,196	30,819	985	49,786	5,938	98,281	30,689	4,000	21,371	—	
Richmond, Fredericksburg & Potomac.....	83	91,595	20,776	187,423	15,886	22,674	2,612	68,078	5,938	115,188	72,235	2,000	70,035	7,658	
St. Louis, San Francisco & Texas.....	243‡	76,042	30,907	117,747	22,972	15,752	2,890	63,208	3,961	108,790	31,672	9736	31,672	—	
Southern Indiana.....	236	111,469	17,340	130,337	13,366	12,644	1,660	54,832	1,225	115,983	14,344	816	8,232	24,779	
Southern Kansas of Texas.....	125	103,129	18,442	126,044	15,105	15,164	2,145	43,346	4,293	106,053	29,991	—	—	27,060	
Spokane International.....	141	60,606	18,090	83,621	10,569	12,574	2,883	24,075	3,048	51,970	12,229	1,787	12,871	—	
Texas Central & Western.....	248	106,334	13,661	124,163	13,255	30,724	1,353	42,009	3,220	88,248	22,801	5,000	22,801	5,828	
Toledo, Peoria & Western.....	242†	106,334	36,912	88,785	11,309	10,995	1,041	34,075	3,2395	92,028	31,158	4,524	27,634	7,826	
Virginia & Southwestern.....	36	29,742	44,772	125,600	18,319	19,652	5,072	32,533	5,072	59,755	29,020	2,345	26,675	—	
Washington Southern.....	133	70,387	44,772	125,600	18,319	19,652	5,072	32,533	5,072	59,755	29,020	6,580	38,195	7,011	
Western Ry. of Alabama.....	228	103,791	30,129	135,483	9,827	8,054	1,661	32,987	2,064	54,593	80,890	1,330	79,540	67,006	
Wichita Falls & Northwestern.....	228	103,791	30,129	135,483	9,827	8,054	1,661	32,987	2,064	54,593	80,890	1,330	79,540	67,006	
SIX MONTHS OF FISCAL YEAR 1911.															
Atlanta & West Point.....	93	\$244,822	\$605,117	\$74,145	\$105,113	\$29,714	\$2,474	\$30,387	\$19,604	\$27,600	\$40,590	\$19,697	\$20,169	\$25,530	
Atlanta & St. Lawrence.....	167	433,894	168,573	663,384	160,040	155,370	2,610	24,444	2,610	19,604	643,115	50,714	30,545	148,900	
Atlantic City.....	167	395,073	752,488	1,201,396	153,100	70,599	18,828	54,535	8,283	79,765	406,631	42,000	332,527	64,802	
Buffalo & Susquehanna R. R.	265	708,503	49,699	708,503	159,719	134,949	12,758	147,258	12,758	147,258	147,258	147,258	147,258	147,258	
Butte, Anaconda & Pacific.....	91	319,702	67,151	403,639	48,681	168,757	5,003	162,782	19,357	19,357	140,456	941	10,329	11,735	
Chicago, Peoria & St. Louis.....	255	725,115	176,603	946,582	143,463	192,029	4,273	42,738	4,273	42,738	141,696	27,000	26,284	34,473	
Cincinnati & Muskingum Valley.....	148	355,551	129,927	517,364	127,849	121,284	12,447	210,522	8,866	375,668	141,696	—	29,000	39,896	
Cincinnati Northern.....	246	530,841	129,763	704,311	102,936	143,73	13,834	218,926	17,898	545,154	159,154	29,000	228,131	41,280	
Denver, Northwestern & Pacific.....	215	388,003	216,397	634,860	75,642	81,546	14,894	195,819	20,826	388,759	246,131	2,972	52,977	34,197	
Detroit, Grand Haven & Milwaukee.....	360	587,984	178,253	704,597	60,379	95,739	12,682	161,07	16,107	388,305	219,108	18,600	201,693	92,839	
Detroit, Grand Haven & Milwaukee.....	191	586,104	139,529	1,047,770	158,573	126,613	48,321	126,613	48,321	828,830	219,920	13,340	246,400	24,400	
Duluth, Missabe & Northern.....	191	4,854,424	159,661	5,072,579	438,577	368,746	3,008	89,963	85,913	3,186,372	3,186,372	4,744	378,563	1,425,680	
Fort Worth & Rio Grande.....	196	332,774	108,992	7,472,805	670,167	60,598	10,281	1,031,255	95,786	2,404,027	5,068,778	49,744	2,404,027	5,068,778	
Houston East & West Texas.....	191	476,273	123,823	706,323	97,297	60,588	12,724	232,201	22,957	433,761	95,073	12,828	82,245	7,117	
Indianapolis Southern.....	179	460,246	134,534	619,662	128,744	88,375	10,145	225,674	22,957	443,000	153,037	20,719	241,612	5,765	
Illinoian & Hudson River.....	96	686,557	26,278	724,059	97,045	96,744	12,682	174,767	17,475	446,625	136,954	23,861	228,131	41,280	
Louisiana & Arkansas.....	255*	593,169	101,610	723,035	118,804	108,804	10,038	191,757	22,676	443,639	143,639	18,600	201,693	33,616	
Louisville, Henderson & St. Louis.....	200	383,974	218,722	642,653	157,754	69,394	30,595	204,839	30,595	453,231	269,804	15,750	240,504	23,036	
Midland Valley.....	324	432,853	207,227	677,779	122,600	123,927	12,447	123,927	12,447	3,186,372	3,186,372	2,193	160,000	149,710	
Nevada Northern.....	165	655,675	41,494	755,625	66,665	60,551	6,034	103,202	12,345	469,193	123,760	6,899	32,853	10,630	
New York, Chicago &															

STATE COMMISSIONS.

The Minnesota Railway Commission will begin an investigation of the reasonableness of the express rates in that state in St. Paul on March 29.

J. H. Hale, of South Glastonbury, has been appointed a member of the Connecticut State Railroad Commission, in place of William O. Seymour, deceased.

The Wisconsin Railway Commission has issued an order requiring the Chicago & North Western, Chicago, Milwaukee & St. Paul and Green Bay & Western to reduce the rate on bituminous coal from Milwaukee, Sheboygan, Manitowoc and Green Bay to points in the Fox River valley paper mill district, from 75 to 65 cents a ton. The order was issued on petition of thirty paper and pulp manufacturers. The commission refused the petition of manufacturers of the Wisconsin River Valley, of a like nature, and decided that the existing tariff of \$1 a ton was equitable and not excessive.

COURT NEWS.

Iowa Law Regulating Employees' Insurance Sustained.

The decision of the Supreme Court of the United States, sustaining the law of Iowa, forbidding railway companies to require from members of relief associations an agreement that if they accept the benefits of the association they will not sue the company for damages, was briefly noticed in the *Railway Age Gazette* of February 24, page 366. The suit was an appeal from a decision in which C. L. McGuire recovered \$2,000 from the Chicago, Burlington & Quincy for an injury. The law, which was passed in 1898, says, in substance, that railways shall be liable for damages due to neglect of agents and no contract which restricts such liability shall be binding; also that the acceptance of relief, insurance, benefit or indemnity shall not constitute a defense to any cause for action; but settlements made between the employer and the employee after the injuries have been received, are not forbidden.

The decision is by Justice Hughes. He does not discuss the merits or demerits of the relief plan, as the only question before him is whether the statute is repugnant to the federal constitution. It is clearly within the competency of a legislature to prescribe the measure of responsibility of a railway corporation for injuries to employees. The legislature, provided it acts within its constitutional authority, is arbiter of the public policy for the state. If dealing only with the common law, a court might uphold or condemn contracts according to its own view of public policy, but where the legislature has acted, the court must yield to the legislature's will, if expressed in accordance with the organic law. The legislature has not placed any obstacle in the way of insurance, nor does it forbid a settlement of damages which an injured employee may make fairly after an injury is received. The statute merely nullifies a stipulation, made in advance of an injury, that the subsequent acceptance of benefits shall constitute full satisfaction of claims for damages.

This, it is claimed, violates the constitutional right to make contracts; but freedom of contract is a qualified, not an absolute right. The guaranty of liberty does not withdraw from the legislature the power to provide restrictive safe-guards. The government may rightfully restrain some individuals from all contracts as well as all individuals from some contracts. Decisions are here quoted sustaining the right of the federal government to regulate matters of national concern and of the states to regulate hours of labor, the sale of intoxicating liquors, the sale of cigarettes without license, the making of contracts for options on grain, the employment of women in laundries more than ten hours a day, etc. Where legislative action is arbitrary and has no reasonable relation to a purpose which it is competent for the government to effect, it is unconstitutional. But the court in deciding the question of power must not confuse that with considerations of policy. Whether the law is wise or unwise is to be settled by the legislature. If the legislature may require the use of safety devices, it may prohibit agreements to dispense with them. If it may restrict employment in mines to eight hours a day, it may make contracts

for longer service unlawful. The interference with the right to contract is incidental to the main object of the regulation.

Employers and employees often do not stand on an equality. Employers may lay down rules which the employees are practically constrained to obey. The self-interest of the employer is often an unsafe guide and the legislature may properly interpose its authority. The state may have a duty to protect a man against himself. It retains an interest in his welfare, however reckless he may be. In the Iowa law under review, the legislature extended the liability of the common law by abolishing the fellow-servant rule. Having authority to establish this regulation, it is manifest that the legislature was also entitled to insure its efficacy by prohibiting contracts in derogation of its provisions. In the exercise of this power the legislature was not limited with respect either to the form of the contract, or the nature of the consideration, or the absolute or conditional character of the engagement. It was as competent to prohibit contracts, which on a specified event, or in a given contingency should operate to relieve the corporation from the statutory liability which would otherwise exist, as it was to deny the validity of agreements of absolute waiver. If the legislature had the power to prohibit contracts limiting the liability imposed, it certainly could include in the prohibition stipulations of that sort in contracts of insurance, relief, benefit or indemnity, as well as in other agreements.

But if the legislature could specifically provide that no contract for insurance relief should limit the liability for damages, upon what ground can it be said that it was beyond the legislative authority to deny that effect to the payment of benefits, or the acceptance of such payment, under the contract? The asserted distinction is sought to be based upon the fact that under the contract of membership the employee has an election after the injury. But this circumstance, however appropriate it may be for legislative consideration, cannot be regarded as defining a limitation of legislative power. The power to prohibit contracts, in any case where it exists, necessarily implies legislative control over the transaction, despite the action of the parties. The payment of benefits is the performance of the promise to pay contained in the contract of membership. If the legislature may prohibit the acceptance of the promise as a substitution for the statutory liability, it should also be able to prevent the like substitution of its performance.

Whether the policy declared by the statute in question is approved or disapproved, it cannot be said that the legislative power has been exceeded, either in defining the liability or in the means taken to prevent the legislative will, with respect to it, from being thwarted.

It was claimed that this act denies the equal protection of the laws because there are members of the relief association to whom it does not apply; but, says the decision, it was entirely competent for the legislature in enacting the prohibition, for the purpose of securing the enforcement of the liability it had defined, to limit it to those cases in which the liability arose.

Life Passes Unlawful.

The Supreme Court of the United States has reversed the decision of the Court of Appeals of Kentucky, in the case of Mottley and wife, who had a contract for a life pass throughout the lines of the Louisville & Nashville, but who were deprived of the pass after the amendment of the Interstate Commerce Law in 1906, because the road held that to continue it would be contrary to the law.

The decision is by Mr. Justice Harlan. Mottley and his wife were injured in a collision in 1871, and the contract for free rides was given in liquidation of damages. The first question is, whether Congress in adopting the law in 1906 intended to invalidate a contract like this which had been running 35 years; it being admitted that the contract was lawful at the time it was made. The Interstate Commerce Law, as passed in 1887, prohibited the transportation of any person for "a greater or less compensation" than was exacted from other persons. The amendment in 1906 made this read "a greater or less or different compensation." It cannot be supposed that Congress introduced the two additional words without a distinct purpose. The aim was to cure a defect in the law; to prohibit carriers from receiving compensation except as indicated in their published tariffs. The Louisville & Nashville therefore, could not lawfully accept from Mottley any compensation dif-

ferent in kind from that mentioned in its published tariffs. And it cannot be doubted that the tariff rates were payable only in money. They cannot be paid in any other way without producing the utmost confusion and defeating the policy of Congress. It would be of no avail for a prospective passenger to examine the published tariffs if the rates therein could be disregarded in special cases by the acceptance of property of various kinds and of such value as the parties immediately concerned chose to put upon it. A ruling of the Interstate Commerce Commission to this effect is quoted with approval. If a person reading a tariff cannot be sure that it tells him what will be exacted from all other persons, the door is opened to the grossest frauds upon the law.

Congress in passing the law made exceptions; certain classes might receive free transportation; but it did not make any exception for existing contracts. On the contrary, the prohibition applied to "any" carrier for "any" services. Congress having made a number of exceptions, the court cannot add an exception which Congress forbore to make.

It is further said that Mottley's pass was not strictly a free pass, as the railway received a valuable consideration; but this argument is not sound, for the pass would be illegal by reason of not being paid for in money.

On the question of whether Congress in 1906 may thus invalidate a contract made in 1871, innumerable past decisions settle the right of Congress to regulate commerce among the states, with no restrictions except those found in the constitutions. In numerous similar cases heretofore decided, the court has held that contracts must be assumed to have been made subject to the contingency that the law might be changed. For example, the Union Bridge Company (204 U. S. 364,400) had lawfully erected a bridge, but to facilitate navigation the government afterward compelled the bridge company, at its own cost, to make certain changes and alterations. The bridge company, says the court, had erected the bridge subject to the possibility that Congress might at some future time, when the public interests demanded, take action to protect navigation. No obligation of a contract can extend to the defeat of legitimate governmental authority. That the exercise of constitutional power by Congress may be hampered by contracts previously made between individuals is inconceivable. The framers of the constitution never intended any such state of things to exist. There can in the nature of things be no vested rights in an existing law which precludes its change or repeal, nor vested rights in the omission to legislate on a particular subject. If the legislature had no power to alter its police laws when contracts would be affected, then the most important and valuable reforms might be precluded by the simple device of entering into contracts for that purpose.

On the question of whether Mottley may recover damages from the railway, on account of loss of his rights under the contract, the court expresses no opinion.

Exchange of Transportation for Advertising Illegal.

The Supreme Court of the United States on February 20, sustained the circuit court of the northern district of Illinois, in holding illegal a contract between the Chicago, Indianapolis & Louisville, and *Munsey's Magazine*, under which the road for a one-page advertisement was to grant \$500 worth of passenger transportation. Suit was brought by the government under the clause of the Interstate Commerce Law which provides that the Interstate Commerce Commission, having reasonable ground to believe that a carrier is carrying passengers at less than the published rates, may ask the circuit court to summarily inquire into the circumstances. The contract was for the year 1907, and the petition alleged that for the first three months the transportation granted by the road amounted to \$145.10, while the only compensation received was a quarter-page advertisement, which was valued at \$125.

The decision, by Justice Harlan, is based on the same considerations as those in the case of Mottley, above reported. Money has a certain value known to all; while commodities have not. The railway company in its defense, cited an Indiana statute prohibiting free transportation but excepting that issued in payment for printing and advertising, but of course no state enactment can be of any avail as regards interstate commerce, where Congress has taken contrary action.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

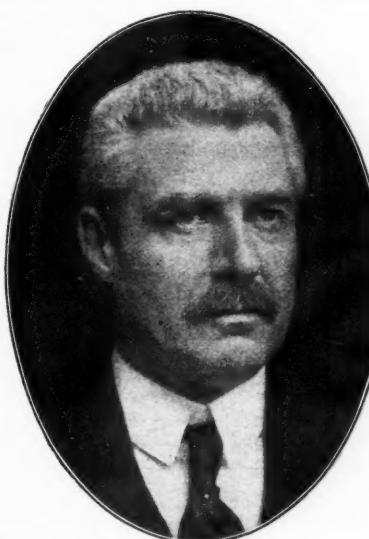
The officers of the Jonesboro, Lake City & Eastern, which was recently reorganized, are as follows: R. E. Lee Wilson, president; C. T. Coleman, vice-president and general counsel; Wright H. Smith, vice-president and general manager; Doswell Brown, secretary and general passenger agent, and J. E. Parr, treasurer, all with offices at Jonesboro, Ark.

Charles E. Pugh, first vice-president of the Pennsylvania Railroad, having retired, as has been announced in these columns, Samuel Rea, second vice-president, has been elected first vice-president; J. B. Thayer, third vice-president, has been elected second vice-president; Henry Tatnall, fourth vice-president, has been elected third vice-president; W. W. Atterbury, fifth vice-president, has been elected fourth vice-president, and W. H. Myers, general manager, has been elected fifth vice-president, all with offices at Philadelphia, Pa.

Samuel Rea, second vice-president of the Pennsylvania Railroad, has been elected first vice-president, succeeding Charles E. Pugh, whose retirement has been announced in these columns.

Mr. Rea was born in Hollidaysburg, Blair county, Pa., September 21, 1855. His first position on the Pennsylvania Railroad was in the engineering department in 1871, as a chainman and rodman on the Morrison's Cove, Williamsburg and Bloomfield branches. The panic of 1873 stopping all engineering work, he entered the office of the Hollidaysburg Iron & Nail Company early in 1874. In the spring of 1875, he re-entered the service of the Pennsylvania Railroad on the engineering corps, and was stationed at Connellsville. From 1875 to

1877 he was assistant engineer in the construction of the chain suspension bridge over the Monongahela river in Pittsburgh, and on its completion was appointed assistant engineer of the Pittsburgh & Lake Erie, then in course of construction, with which he remained until the completion of that road. In 1879 he returned to the Pennsylvania system as assistant engineer in charge of the construction of the extension of the Pittsburgh, Virginia & Charleston. From 1879 to 1883, he was the engineer in charge of surveys in Westmoreland county and of the rebuilding of the western Pennsylvania to make it a low-grade freight line. This work was under the direction of J. N. DuBarry. In 1883 Mr. Rea was transferred to Philadelphia as assistant to vice-president DuBarry, with the title of principal assistant engineer, which he held until 1888, when he was made assistant to the second vice-president. In 1889, he resigned to go to Baltimore as vice-president of the Maryland Central, and chief engineer of the Baltimore Belt. In 1891, on account of ill health, he resigned and left Baltimore, doing no active work for a year. After an absence of three years from the Pennsylvania Railroad, Mr. Rea was on May 25, 1892, chosen assistant to the president of that company. On the day of his appointment he left for London, where he made an examination of the railways terminating in the English metropolis, and of the underground railways—then constructed and proposed—and, subsequently, he made a special report thereon. The result of this experience was afterward put to good service on the Pennsylvania Railroad's New York tunnel extension. After the death of vice-president DuBarry in 1892, Mr. Rea was assigned to general construction work then in



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Samuel Rea.

progress, the acquisition of right of way and real estate for same, the promotion of all new lines or branches, and the financial and corporate work incident thereto. These duties, with the exception of construction work, have since been discharged by him. On February 10, 1897, he was appointed first assistant to the president, and in June, 1899, following the election of A. J. Cassatt as president, Mr. Rea was elected fourth vice-president. On October 10, 1905, he was advanced to third vice-president, and on March 24, 1909, to second vice-president, and in addition to his former duties was placed in charge of engineering and accounting. Mr. Rea is also second vice-president of the Northern Central Railway, Philadelphia, Baltimore & Washington and West Jersey & Seashore Railway companies, and a director of the Pennsylvania Railroad Company, and many other railway and financial corporations. He is a member of the American Society of Civil Engineers and of the Institution of Civil Engineers of London. He is the author of "The Railways Terminating in London," a comprehensive study based on laborious personal investigation of the physical and financial condition of the English railway system. For many years he was interested in the project to bridge the Hudson river from Hoboken to New York City, and thus establish in the metropolis a terminus for the railways using ferries from the New Jersey side. He was one of the incorporators of the North River Bridge Company, chartered by an act of Congress. The other railways failed to join the Pennsylvania Railroad in the project to bridge the Hudson, and after a very careful examination and report on the entire project by engineering experts, the Pennsylvania Railroad determined to build its own tunnel and terminal in the city of New York. After this plan had been fully approved by President Cassatt and the board of directors of the Pennsylvania, Mr. Rea was given direct charge of the work.

Operating Officers.

Ernest Stenger has been appointed general manager of the St. Joseph & Grand Island, with office at St. Louis, Mo.

E. E. Lillie has been appointed superintendent of car service and telegraph of the Oregon Trunk, with office at Portland, Ore.

W. H. Roberts has been appointed superintendent of the Jonesboro, Lake City & Eastern, with office at Jonesboro, Ark.

W. R. Davidson has been appointed a trainmaster of the Middle division of the Grand Trunk, with office at Hamilton, Ont.

John B. Munson, vice-president of the Georgia, Southern & Florida, has been appointed also general manager, with office at Macon, Ga.

C. L. Bardo, superintendent of the electric division of the New York Central & Hudson River, at New York, has resigned to go to the Lehigh Valley, with office at Bethlehem, Pa.

E. P. Tatum, chief despatcher of the Vicksburg, Shreveport & Pacific, has been appointed trainmaster, with office at Shreveport, La., succeeding C. W. Gable, resigned. L. Pridgen succeeds Mr. Tatum.

J. L. Blake having resigned as general manager and traffic manager of the Fort Dodge, Des Moines & Southern at Boone, Ia., the duties of general manager will be assumed by the vice-president.

R. E. Stanfield has been appointed superintendent of the Macon & Birmingham, with office at Macon, Ga., succeeding O. M. Grady, resigned, and the position of F. W. Scott, master of trains, at Macon, has been abolished.

J. C. Hanrahan, assistant trainmaster of the Pennsylvania Lines West, at New Castle, Pa., has been appointed division operator, with office at New Castle, succeeding F. J. Perry, promoted. J. B. Patterson succeeds Mr. Hanrahan.

Robert V. Massey, division engineer of the New York division of the Pennsylvania Railroad, has been appointed superintendent of the New York, Philadelphia & Norfolk, with office at Cape Charles, Va., succeeding Elisha Lee, promoted.

Simon C. Long, general superintendent of the Western Pennsylvania division of the Pennsylvania Railroad, at Pittsburgh,

Pa., has been appointed general manager, with office at Philadelphia, succeeding W. H. Myers, promoted. R. L. O'Donnell, general superintendent of the Buffalo & Allegheny Valley division, at Buffalo, N. Y., succeeds Mr. Long. J. G. Rodgers, assistant to general manager, at Philadelphia, Pa., succeeds Mr. O'Donnell. Elisha Lee, superintendent of the New York, Philadelphia & Norfolk, at Cape Charles City, Va., succeeds Mr. Rodgers. M. Trump, general superintendent of transportation, at Philadelphia, Pa., has been assigned to special duties on transportation problems in connection with the regulations of the national and state railway commissions, with office at Philadelphia. C. M. Sheaffer, superintendent of passenger transportation, at Philadelphia, succeeds Mr. Trump. D. C. Stewart, assistant superintendent of the Pittsburgh division, at Youngwood, succeeds Mr. Sheaffer, and Joseph H. Gumbes, engineer on the Pittsburgh division, at Pittsburgh, succeeds Mr. Stewart.

Traffic Officers.

David H. Street has been appointed traveling freight agent of the Baltimore & Ohio, with office at Philadelphia, Pa.

J. P. O'Donnell has been appointed a commercial agent of the Kansas City, Mexico & Orient, with office at Fort Worth, Tex.

H. D. Harvey has been appointed traveling passenger agent of the Denver, Northwestern & Pacific at Denver, Col., succeeding C. T. Turner, deceased.

W. B. Morgan has been appointed a traveling freight agent of the Central of Georgia, with office at Macon, Ga., succeeding B. P. O. Edwards, resigned.

The title of James Gass, New York State passenger agent of the Wabash Railroad, with office at Albany, N. Y., has been changed to district passenger agent.

H. H. Kamp has been appointed a traveling freight solicitor of the Pittsburgh, Cincinnati, Chicago & St. Louis, with office at Richmond, Ind., succeeding W. H. Phillips, promoted.

C. H. Crooks, general freight and passenger agent of the Fort Dodge, Des Moines & Southern, has been appointed traffic manager, with office at Boone, Iowa, succeeding J. L. Blake, resigned.

M. J. Costello has been appointed a district passenger agent of the Northern Pacific, with office at Cincinnati, Ohio, succeeding J. J. Gartner, traveling passenger agent, resigned to accept service elsewhere.

M. G. Buffington, traveling freight agent of the St. Louis & San Francisco, has been appointed division freight agent, with office at Tulsa, Okla., succeeding W. L. Coleman, resigned to engage in other business.

Charles H. Hagerty, district passenger agent of the Pennsylvania Lines West, at Louisville, Ky., has been appointed an assistant general passenger agent, with office at Louisville, and his former position has been abolished.

H. K. Deale has been appointed a commercial agent of the Georgia, Southern & Florida, with offices at Atlanta, Ga., succeeding W. H. Oliver, resigned, and H. W. Watson has been appointed a traveling freight agent, with office at Cordele, succeeding J. L. Lashley, transferred.

D. Aspland, assistant general agent of the Tonopah & Tidewater and the Bullfrog Goldfield, at Goldfield, Nev., has been appointed general agent, with office at Goldfield, succeeding W. W. Keith, resigned, and the position of assistant general agent at Goldfield has been abolished.

L. C. Shirah, formerly soliciting freight agent of the Georgia, Southern & Florida, and recently in the general passenger department of the Denver & Rio Grande at Denver, Colo., has been appointed soliciting freight and passenger agent of the San Pedro, Los Angeles & Salt Lake, with office at Denver.

W. P. Kenney, assistant traffic manager of the Great Northern at St. Paul, Minn., has been appointed acting general traffic manager, with office at St. Paul, succeeding W. W. Broughton, general traffic manager, resigned to engage in other business. Mr. Kenney will have entire charge over all traffic matters.

E. E. Gibson has been appointed commercial agent in the

freight department of the Missouri Pacific, with office at Lake Charles, La., succeeding J. W. Hailey, resigned. H. C. Young, traveling passenger agent at Pittsburgh, Pa., has had his jurisdiction extended to include the Cleveland territory, excepting the city of Buffalo, N. Y., which is assigned to the general eastern passenger agent at New York City, and the office of traveling agent at Cleveland has been abolished.

Robert A. Chadwick, whose appointment as general freight and passenger agent of the Tennessee Central, with office at Nashville, Tenn., has been announced in these columns, was born February 9, 1869, at Huntsville, Ala., and was educated in the public and private schools of his native town. He began railway work August 1, 1888, with the Memphis & Charleston, now a part of the Southern Railway, remaining with that company until 1900. He was then with the East Tennessee, Virginia & Georgia, now a part of the Southern Railway, for a short time in 1901, and returned to the Memphis & Charleston the same year, remaining with that company until 1902. His next position was in the general freight office of the Georgia Pacific, at Birmingham, which was absorbed by the Southern Railway in 1903. He remained in that position until 1907, when he went with the Alabama Great Southern as chief clerk to the general freight agent, and was later appointed soliciting agent and then assistant freight agent. In November, 1908, he went to Nashville, Tenn., as assistant general freight agent of the Tennessee Central, which position he held at the time of his recent appointment as general freight and passenger agent of the same company.

Harry Judd Phelps, whose appointment as general passenger agent of the Illinois Central and the Indianapolis Southern, with office at Chicago, has been announced in these columns, was born September 3, 1861, at Elmira, N. Y.

He was educated in the public schools and at Elmira Academy, and began railway work in July, 1882, with the Illinois Central. He was a telegraph operator until 1887, and was then promoted consecutively to station agent at Onawa, Iowa; ticket agent at Sioux Falls, S. D.; freight and passenger agent at Baton Rouge, La. From November, 1894, to July, 1905, he was city passenger agent and then city passenger and ticket agent at Chicago. His next promotion was to division passenger agent at Dubuque, Iowa, which office he held until the time of his appointment to general passenger agent.

Eugene Mock, who has been appointed general freight agent of the Midland Valley, with office at Muskogee, Okla., as was previously announced in these columns, was born May 17, 1878, at Coatesville, Mo. He received a common school education, and began railway work in June, 1894, as a messenger for the Keokuk & Western, and he was promoted consecutively to operator, agent, relief agent, relief clerk in various departments, and traveling auditor. In June, 1900, he became a clerk in the accounting department of the Chicago, Burlington & Quincy at St. Joseph, Mo., and six months later went with the St. Joseph & Grand Island at St. Joseph with the same title. He was appointed traveling freight and passenger agent of the Choctaw & Northern, now part of the Rock Island Lines, at Geary, Okla., in April, 1901, and the next year became chief clerk to the division freight agent of the Rock Island at Oklahoma City, Okla. In October, 1902, he was made auditor of the St. Louis & Gulf and the St. Louis, Memphis & Southeastern, and in June, 1904, went with the St. Louis & San Francisco at St. Louis, Mo.

He was appointed chief clerk to the traffic manager of the Midland Valley at Ft. Smith, Ark., in August, 1904, and from February, 1907, until February 13, 1911, when he was appointed to the above position, he was traffic manager of the Oklahoma Coal Operators' Association at McAlester, Okla.

Eugene W. Clapp, who has been appointed assistant general freight and passenger agent of the Southern Pacific and general freight and passenger agent of the Arizona Eastern, with office at Tucson, Ariz., as was previously announced in these columns, was born February 25, 1874, at Memphis, Tenn. He was educated in the public and private schools of Memphis, and spent two years in Webb Brothers' School for Boys, at Belle Buckle, Tenn. He began railway work in October, 1891, as a stenographer to the assistant general superintendent of the Southern Pacific at San Francisco, Cal., and soon afterward was transferred to Tucson, Ariz., as stenographer-clerk to the division superintendent. In November, 1895, he was transferred to train service, and the next year became a ticket clerk at Lordsburg, N. M., where he was promoted to chief clerk and cashier in January, 1897. Six months later he was made agent and assistant trainmaster. He was promoted to traveling freight and passenger agent at San Francisco in November, 1905, and the next year to district freight and passenger agent at Reno, Nev., in charge of Nevada territory and part of California, where he remained until November, 1909. He was then transferred to Fresno, Cal., as division freight and passenger agent, and to San Francisco as chief clerk in the general freight office in August, 1910. In November, 1910, he was appointed general agent of the Sunset Route and the Atlantic Steamship Lines, with office at San Francisco, from which position he has just been promoted.

Engineering and Rolling Stock Officers.

The position of chief engineer of the Macon & Birmingham held by W. C. Shaw, Jr., at Macon, Ga., has been abolished.

G. C. Nichols has been appointed master mechanic of the Jonesboro, Lake City & Eastern, with office at Jonesboro, Ark.

F. H. Reagan has been appointed superintendent of the Scranton (Pa.) locomotive shops of the Delaware, Lackawanna & Western.

A. C. Watson has been appointed assistant division engineer of the Pennsylvania Company, with office at Fort Wayne, Ind., succeeding A. S. Bland, transferred.

C. N. Page, trainmaster of the Lehigh Valley, at Auburn, N. Y., has been appointed also master mechanic, with office at Auburn, succeeding J. N. Mowery, resigned.

R. L. Doolittle, master mechanic of the Atlanta, Birmingham & Atlantic, with office at Fitzgerald, Ga., has been appointed superintendent of motive power, a new position, and his former office has been abolished.

A. C. Adams, superintendent of motive power of the Spokane, Portland & Seattle, has been appointed superintendent of motive power also of the Oregon Electric and the United Railways Co., with office at Portland, Ore.

G. P. Palmer, assistant engineer of the Baltimore & Ohio at Chicago, has been appointed division engineer of the Baltimore & Ohio Chicago Terminal, with office at Chicago, succeeding E. N. Layfield, resigned.

D. K. Colburn, bridge engineer of the Galveston, Harrisburg & San Antonio and the Louisiana Western at Houston, Tex., has been appointed engineer of maintenance of way, with office at Houston, succeeding A. V. Kellogg, deceased.

T. A. Lawes, master mechanic of the Chicago, Terre Haute & Southeastern at Terre Haute, Ind., has been appointed mechanical engineer of the New York, Chicago & St. Louis, with office at Cleveland, Ohio, succeeding L. B. Morehead, resigned.

John Williams Corcoran, supervisor of roadway and track of the Pittsburgh & Lake Erie, has been retired under the pension rules of the company. Daniel F. Harvey has been appointed supervisor, in charge of roadway and track of Sub-district No. 3, with office at Beaver Falls, Pa.

G. J. Duffey, assistant master mechanic of the Lake Erie & Western, the Fort Wayne, Cincinnati & Louisville and the Northern Ohio, at Lima, Ohio, has been appointed master mechanic, with office at Lima, succeeding F. H. Reagan, resigned,



H. J. Phelps.

to accept service with another company. W. T. Kuhn succeeds Mr. Duffey.

Minot R. Smith, whose appointment as master mechanic of the Chicago, Indianapolis & Louisville, with office at Lafayette, Ind., has been announced in these columns, was born November 5, 1870, at Erie, Pa. He was educated at Marshall College, Huntington, W. Va., and began railway work in 1886 as a machinist apprentice on the Chesapeake & Ohio at Huntington. In 1890 he went to Covington, Ky., as a machinist with the Kentucky Central and its successor, the Louisville & Nashville. He then returned to the Chesapeake & Ohio, going first to Lexington, Ky., and then to Covington, where he was at different times machinist, tool-room foreman and gang foreman. In 1904 he was transferred to Russell, Ky., as general foreman, remaining there for six years. His next position was machine shop foreman of the Louisville & Nashville, first at Louisville and then at New Decatur, Ala. He was appointed master mechanic in charge of terminals of the Chicago, Indianapolis & Louisville at Lafayette, Ind., in December, 1910, which position he held until his recent promotion.

Purchasing Officers.

W. A. Hopkins has been appointed supply agent of the Missouri Pacific, with office at St. Louis, Mo., succeeding C. A. How, promoted.

F. H. Greene, general purchasing agent of the New York Central Lines, at New York City, has resigned to become president of the Hale & Kilburn Manufacturing Company, Philadelphia, Pa.

Special Officers.

Dr. Guy G. Dowdall has been appointed chief surgeon of the Illinois Central, with office at Chicago, succeeding Dr. John E. Owens, assigned to consulting duties.

Charles C. Custer has been appointed general advertising manager of the Chicago & North Western, with office at Chicago, succeeding Charles G. Hall, resigned.

OBITUARY.

J. W. Maxwell, general superintendent of the St. Louis Southwestern, died at Tyler, Texas, on March 7.

W. B. Gwyn, formerly secretary of the Norfolk & Southern, now the Norfolk Southern, was killed in an elevator accident on March 3, at Norfolk, Va.

C. M. Case, assistant engineer of the St. Louis & San Francisco, with office at Fort Worth, Tex., died on March 4. Mr. Case was formerly chief engineer of the Chicago, Rock Island & Gulf.

Harry Hickley Hall, general counsel of the New Orleans & Northeastern, the Alabama & Vicksburg and the Vicksburg & Shreveport, at New Orleans, La., died March 7. Mr. Hall was born February 12, 1846.

J. G. Searles, formerly general coal freight agent of the Pennsylvania Railroad, died at Philadelphia, Pa., March 7. Mr. Searles was born in Tiffin, Ohio, December 20, 1848, and was educated in the district schools. At the age of sixteen he entered railway service as a clerk on the Dayton & Michigan, and in June, 1865, went to the Atlantic & Great Western. On March 1, 1867, he was appointed agent of the Farmers' Railroad at Petroleum Centre, Pa., and in October, 1871, he was appointed joint agent at Irvineton, of the Philadelphia & Erie, Empire Line, and Oil Creek & Allegheny River. In June, 1875, he was transferred to Erie as agent of the Empire Line, and on March 1, 1877, he was transferred from Erie to Baltimore, as agent of the Empire and Anchor Lines. He was appointed division freight agent of the Baltimore division of the Northern Central and the Baltimore & Potomac, with office in Baltimore, in July, 1885, and in May, 1892, he was promoted to coal freight agent, having special charge of the coal and coke traffic of the Pennsylvania Railroad and the making of rates therefor. On June 1, 1903, the organization having been changed, he was made general coal freight agent, and on account of ill health, on May 25, 1910, Mr. Searles was assigned to other duties.

Railway Construction.

New Incorporations, Surveys, Etc.

ARIZONA EASTERN.—The Grant Brothers Construction Company, Los Angeles, Cal., has been given a contract for changing the line near Hayden, Ariz., and Winkelman. The present line between Hayden and Kelvin is to be relaid with 90-lb. rail.

ATLANTA, WAYCROSS & NORTHERN.—Contracts are to be let in about 90 days to build from tidewater at St. Marys, Ga., northwest via Garrant, Barrows Bluff and Abbeville, to a point north of Grovania, about 200 miles. The prospects of building the line are good. Track has already been laid on 12 miles, and work is now under way completing the surveys. The plans call for putting up terminals, wharves, etc. B. G. Zeigler, consulting engineer, Rocky Ford.

BEDFORD & HOLLIDAYSBURG.—See Pennsylvania Railroad.

BRITISH COLUMBIA ELECTRIC.—This company proposes to double-track its line between Vancouver, B. C., and Eburne.

CANADIAN NORTHERN.—An officer is quoted as saying that the line between Montreal, Que., and Ottawa, Ont., will be finished during 1911, although it is not expected to be ready for passenger traffic this year. Work on the new line from Ottawa to Toronto will probably be finished during 1911.

Work is to be started at once by the Cowan Construction Company, it is said, on about 200 miles in Alberta from the Pembina river, westward to the Yellow Head Pass.

This company has commenced work, it is said, on lines in the island of Vancouver, B. C. The first work to be carried out will be from Victoria, northwest to Alberni.

CANADIAN ROADS.—Plans are being made by C. J. Leyland, Haggerstown Castle, Scotland, who owns coal property near the Yellow Head Pass, B. C., to build a 20-mile line to connect the mines with the Grand Trunk Pacific.

CENTRAL VERMONT.—See Grand Trunk.

EASTERN MAINE.—Application has been made for a charter in Maine. The plans call for building from Brewer, Me., north to Houlton, with trackage rights over the Maine Central from Bangor to Brewer. The route from Brewer runs east about 20 miles, thence north crossing the Vanceboro division of the Maine Central at or near Bancroft. E. H. Blake, A. Warren, C. P. Thomas, S. H. Woodbury and A. G. Thomas, are interested.

DURANGO & LLANO GRANDE.—See National Railways of Mexico.

ERIE RAILROAD.—An officer writes regarding the reports that double-tracking work is to be carried out west of Salamanca, N. Y., during 1911, that the company is simply going ahead with the double-tracking work, but has no definite plans at the present time.

FRESNO, HANFORD & SUMMIT LAKE INTERURBAN.—This company has entered into a contract with the Hudson Counties Company, New Jersey, for building from Fresno, Cal., southeast to Kingsburg, thence northwest via Sanger, returning to Fresno. The work includes putting up some station buildings. A subcontract has been given to the Pinkerton Construction Company, Philadelphia. All the work is to be finished within one year.

GEORGIA & FLORIDA.—The Sparks Western, which has been taken over by this company, expects to have construction work finished within 30 days and the line open for operation from Sparks, Ga., to Moultrie, 22 miles.

GRAND TRUNK.—This company has finished the work of replacing the 80-lb. rail between Montreal, Que., and Toronto, Ont., with 100 lb. rail and will continue similar improvements during the coming summer between Niagara Falls and London, Ont. It is the intention to lay 100-lb. rail with rock ballast on the entire double-track system.

Surveyors are now at work laying out a 50-mile line to be built by the Central Vermont between Windsor, Vt., and Brattleboro, to avoid using the Boston & Maine tracks.

Details are being arranged with the various towns and villages through which the extension of the Grand Trunk to Providence, R. I., is to pass. Right-of-way is being secured, and it is expected that all the preliminaries will have been completed by the coming spring. (June 17, p. 1568.)

IOTHERMAL TRACTION CO.—An officer writes that this company will take out a charter under the name of the North Carolina Interurban, to build from Gastonia, N. C., which will probably be changed to Charlotte, west via Dallas, Cherryville, Waco, Shelby, Forest City, Rutherfordton and Chimneyrock to Asheville, about 75 miles, with branch lines from Cherryville, south to Kings Mountain; Cherryville, north to Hickory; Shelby, north to Morgantown; Rutherfordton, southwest to Tryon, and from Asheville, north and west. The work will not be difficult outside of the section crossing the Blue Ridge mountains. Maximum grades from Gastonia to Rutherfordton will be 2 per cent. and from Rutherfordton to Asheville, in the mountain section, about 3 per cent. Maximum curvature, 16 degrees. There will be 12 steel bridges, varying in length from 25 ft. to 125 ft. each. All plans and estimates for the section from Rutherfordton to Asheville have been finished, and for the section from Rutherfordton east, will be finished soon, as well as for power houses to be built at Chimneyrock. Contracts will be let about June 1. Construction on one or two short sections will probably be started in the near future. The company will consider any applications from good reliable firms or corporations to carry out the work. The line will carry products from cotton mills, as well as timber. The officers of the company are L. L. Jenkins, president, Asheville; Geo. L. McKay, general manager, and Wythe M. Peyton, chief engineer, both of Rutherfordton.

KANSAS & SOUTHEASTERN.—An officer writes that a contract has been given to the St. Louis Construction Company, and the prospects of building the line are good. The plans call for a line from Almena, Kan., southeast to Anthony, 250 miles. There will be a number of concrete bridges. The principal commodities the line will carry are wheat and other grains and coal. S. V. Wardall, president, and E. W. Wardall, chief engineer, Larned.

KETTLE VALLEY.—According to press reports, this company proposes to let contracts in the near future, and expects to have the 60-mile gap between Merrit, B. C., and Midway finished by August.

KOOTENAY CENTRAL.—Bids are to be asked in April, it is said, for building a section of 50 miles south of Golden, B. C.

LAWTON, DUNCAN & ARDMORE.—A preliminary survey has been made from Lawton, Okla., southeast via Duncan to Ardmore, and construction work is to be started soon. This is the first section of a line which is eventually to be extended southeast from Ardmore to Denison, Texas, or Sherman. A bonus of \$100,000 has been raised by residents of the city of Ardmore and a similar amount is to be given by Lawton, and Duncan will subscribe about half that amount, as well as 21.5 miles of the right-of-way. The Lawton Board of Trade was the original promoters. The Development Corporation of Philadelphia has since become interested, and the railway company was chartered recently with \$2,000,000 capital. E. R. Sutton, president, Philadelphia. Dr. Herbert M. Howe, associated with R. L. Robertson and J. L. Hamon, Lawton, are interested.

LOCK HAVEN & JERSEY SHORE (Electric).—This company proposes to build from Lock Haven, Pa., northeast along the Susquehanna river to Jersey Shore. Right-of-way has already been secured, with the exception of the section through Woodward township. L. M. Patterson, president, Lock Haven. C. E. Covert, Harrisburg; R. S. Walton and A. M. Hoagland, Williamsport, and G. J. Patterson, Pittsburgh, are interested.

MAINE CENTRAL.—A bill has been introduced in the Maine legislature, authorizing this company to build under the name of the Rangeley Lakes & Megantic, from the Rangeley Lakes terminal of the Main Central, north about 40 miles to a junction with the Canadian Pacific and Quebec Central, at Lake Megantic, Que.

MAHONING & SHENANGO RAILWAY & LIGHT CO.—An officer is quoted as saying that this company will spend \$500,000 during 1911 for improvements to be made between Leavittsburg, Ohio, and New Castle, Pa. Some of the existing lines are to be double-tracked.

MARSHALL & EAST TEXAS.—An officer writes that an issue of \$5,000,000 of bonds has been authorized to secure funds for

building extensions and for reconstructing the present line between Marshall and Winnsboro, Texas, 74 miles. It has not yet been decided when this work will be started. The company now has 92 miles of railway in operation from Winnsboro southeast to Elysian Fields. (May 13, p. 1237.)

MINNEAPOLIS, ST. PAUL, ROCHESTER & DUBUQUE (Electric).—An officer writes that contracts are to be let in March, April and May to build a 70-mile extension from Northfield, Minn., south via Faribault, to Owatonna, thence east via Dodge Center and Kasson to Rochester, about 65 miles. The company already has 40 miles of track laid. The work involves handling about 12,000 cu. yds. of earth a mile. There will be some cuts 32 ft. wide, and fills of 16 ft. Maximum grade will be 1.5 per cent. compensated and maximum curvature 5 deg. There will be three or five steel bridges, each 80 ft. to 125 ft. long, and few trestles over 150 ft. long. F. G. L. Hunt, chief engineer, Minneapolis.

NATIONAL RAILWAYS OF MEXICO.—According to press reports, the National Railways of Mexico will build the line from Durango, Mex., southeast to Gutierrez, Zacatecas, which is on the old main line of the Mexican Central, 155 miles. The government of Durango has granted a subsidy of about \$600,000 for that portion of the line through Durango, and it is understood that the state of Zacatecas has granted a subsidy for a similar amount. (October 21, p. 759.)

Work is being pushed on the Durango & Llano Grande, building from Durango, Mex., westerly to Llano Grande, about 65 miles. (November 25, p. 1023.)

NORTH CAROLINA INTERURBAN.—See Isothermal Traction Co.

NORTH COAST.—See Oregon—Washington Railroad & Navigation Company.

OAKLAND & ANTIOCH (Electric).—Application has been made in Contra Costa county, Cal., for a franchise to build from Concord to Castle Rock, at the base of Mount Diablo.

OREGON ROADS.—According to press reports, plans are being made to build a line from Madras, Ore., southeast to Prineville, about 35 miles. F. S. Forest and G. Nelson, officials of the Inland Empire Development Co., are said to be interested. This is thought to be a project of the Hill lines. It is understood that there will be a race between the Hill lines and the Harriman lines to secure right-of-way for a branch to Prineville.

OREGON-WASHINGTON RAILROAD & NAVIGATION COMPANY.—Contracts were recently let for work on about 40 miles of the North Coast between Spokane, Wash., and Ayer, on the Snake river, which are 103 miles apart as follows: G. A. Carlson & Co., W. L. Trimble, and George Chew, Spokane, and Eschbach, Bruce & Co., North Yakima. The work includes piercing nine tunnels and all the work is to be finished within 18 months. A large force of men will be put to work at once. (February 17, p. 334.)

PANAMA-DAVID.—The Panama government has announced that it will ask for bids until June 30, to build from the city of Panama, west to David, near the Costa Rican frontier. The line is to have a total length of 362 miles. Surveys have been made for a long time. The new line is to be the Panama link of the proposed Pan-American Railway, through Central America to a connection with the Mexican extension of the Southern Pacific. (February 10, p. 302.)

PENNSYLVANIA, MONONGAHELA & SOUTHERN.—See Pennsylvania Railroad.

PENNSYLVANIA RAILROAD.—The report of this company for the year ended December 31, 1910, under date of March 3, 1911, shows that in addition to the Filbert street extension leading into Broad Street station, Philadelphia, Pa., further extensions and improvements at the Broad Street station are contemplated to accommodate the passenger traffic in and out of Philadelphia. Plans for this work are now being made. Satisfactory progress was made revising the grade and completing the four-track system through Greensburg, including a new passenger station and the elimination of the Greensburg tunnel. Two additional tracks through Greensburg have been finished and the old tunnel abandoned. Work is nearing completion on the Northumberland classification yard, and the new line between the Williams-

port and Sunbury divisions in connection with this work has been finished. A large amount of grade elimination work in New Jersey and Pennsylvania was carried out during the year. It is expected that work will be finished this year on the elimination of the grade crossings in the city of Bristol, Pa., which called for the construction of a new line through the city. Construction work on the eastern section of the relief line between Newark, N. J., Trenton and Morrisville will be started. Contracts for rebuilding the Cortlandt street ferry, New York City, necessitated by establishing new street and harbor lines, have been let and it is expected the work will be finished in 1912. It is also expected that the new rapid transit line, which included the electrification of the present tracks, from the Hudson & Manhattan tunnel system, near Summit avenue, Jersey City, to Manhattan Transfer, and a branch from that place to Park place, Newark, will be finished during the summer of 1911. Elevation work on the Kensington branch, including the elimination of all grade crossings on that branch, has been finished, as well as improvements in the Kensington station. The Harrison yard and its facilities, now known as Manhattan Transfer, near Newark, N. J., was placed in operation in November, 1910. The New York tunnel extension was finished during 1910 and the East river division from the Pennsylvania station, New York into Long Island, is now in operation. The western portion, from the station, in the borough of Manhattan under the North river to Harrison, N. J., has also been opened for traffic. The remaining work on the tunnel extension at Harrison, N. J., and at Sunnyside yards, Long Island, and the electrical and station facilities and equipment will be fully completed in the early part of the present year. Extensive improvements were made on the Buffalo division, Western New York & Pennsylvania Railroad, including changes of line and grade, also additional track and sidings. The extension of the Bedford & Hollidaysburg Railroad was completed and opened for operation from Imler, Pa. to Brooke's Mills, 10.81 miles. Further work was carried out on the Rice's Landing extension of the Pennsylvania, Monongahela & Southern, to provide track and station facilities. The new yard and engine house at Orangeville, Md., near Baltimore, is nearing completion, and considerable progress was made on the construction of the new passenger station at Baltimore, and the enlargement of the facilities and rearrangement of the tracks. On the West Jersey & Seashore the elevation of tracks from Wright avenue to Spruce street in Camden, N. J., has been completed and placed in operation. See comments of this company elsewhere in this issue.

RANGELEY LAKES & MEGANTIC.—See Maine Central.

SOUTHERN RAILWAY.—The Southern Railway's new cut off around Lynchburg, Va., which is ten miles long and cost \$4,000,000, was opened for freight traffic March 1. Passenger trains will use the new line in about one week.

SPARKS WESTERN.—See Georgia & Florida.

ST. LOUIS SOUTHWESTERN.—This company has given a mortgage to secure funds for the new extension under construction from Stuttgart, Ark., north to Hazen, 45 miles, and from England, east to Stuttgart. All the grading has been finished and track laid on 30 miles. It is expected to have all the track laying finished during March.

ST. PAUL SOUTHERN (Electric).—An officer writes that grading work will probably be started early this spring on a line from St. Paul, Minn., southeast via Hastings, Wacouta and Lake City to military camp grounds, 57 miles. There will be about 17,000 cu. yds. of material to be handled a mile. The work includes a 400-ft. bridge, with approaches, over the Mississippi river north of Hastings. Address W. L. Sonntag, general manager of the St. Paul Railway Promotion Co., St. Paul.

WEST JERSEY & SEASHORE.—See Pennsylvania Railroad.

WESTERN NEW YORK & PENNSYLVANIA.—See Pennsylvania Railroad.

WEST PENN TRACTION.—An officer writes that the company now has work under way on three extensions as follows: Leisenring, Pa., southwest to Uniontown, eight miles; Greensburg to Jamison, seven miles, and Masontown to Martin station, three miles. Material has been bought and contracts have been let for the work. (February 24, p. 369.)

Railway Financial News.

ATCHISON, TOPEKA & SANTA FE.—Augustus D. Juliard has been elected a director, succeeding Paul Morton, deceased.

BALTIMORE, CHESAPEAKE & ATLANTIC.—The Pennsylvania Railroad and the Philadelphia, Baltimore & Washington have been granted permission by Maryland Public Service Commission to buy at \$70 a share the \$478,100 minority preferred stock of the B. C. & A. deposited with the Colonial Trust Company of Baltimore. The Pennsylvania already owns all of the \$1,000,000 common and 78 per cent. of the \$1,600,000 preferred.

BOSTON & MAINE.—A press despatch from Boston says that the Vermont Valley Railroad, a subsidiary of the Boston & Maine, has bought the interest held by the Sortwell estate in the Montpelier & Wells River, the Barre Bridge Railroad and the Barre Railroad. The Montpelier & Wells River runs from Wells River, Vt., to Montpelier, with a branch to Barre, a total of 45 miles.

BUFFALO CREEK RAILROAD.—The New York Public Service Commission, Second district, has authorized this company to make a mortgage securing \$5,000,000 first refunding mortgage 5 per cent. 50-year bonds. The company is authorized to issue \$1,000,000 bonds to retire at par its 5 per cent. bonds of 1891. In addition, the company is authorized to issue \$1,021,000 bonds to make additions to its property.

CHICAGO, MILWAUKEE & PUGET SOUND.—Kuhn, Loeb & Co. and the National City Bank, both of New York, have bought \$25,000,000 first mortgage 4 per cent. bonds of 1909-1949, principal and interest unconditionally guaranteed by the Chicago, Milwaukee & St. Paul.

The Commercial & Financial Chronicle, in a recent issue, says that an initial dividend of 2 per cent. had been declared on the \$100,000,000 stock of the Puget Sound, all of which is owned by the St. Paul.

CHICAGO, MILWAUKEE & ST. PAUL.—This company and the Chicago & North Western have made a bargain with the New York Central interests as a result of which the North Western and the St. Paul will each acquire 20 per cent. of the Indiana Harbor Belt's stock and 20 per cent. of its outstanding notes. It is planned that the Indiana Harbor Belt shall authorize the issuance of \$12,000,000 more bonds, the proceeds to be used in completing its second track and enlarging its track facilities at junction points. The Indiana Harbor Belt now connects with the St. Paul at its Franklin Park yard and with the North Western at its Proviso yard. The acquisition of interest in it by the North Western and the St. Paul no doubt indicates that it is to be in future a more important connection between the New York Central lines and these roads for the transfer of cars which do not need to be moved into or out of the business district of Chicago.

CHICAGO & NORTH WESTERN.—See Chicago, Milwaukee & St. Paul.

CHICAGO, TERRE HAUTE & SOUTHEASTERN.—F. J. Lisman & Co., New York, are offering the unsold portion of \$3,100,000 outstanding first and refunding mortgage 5 per cent. bonds of 1910-1960 at 98, yielding about 5.10 per cent. income. The balance of the \$20,000,000 authorized bonds are reserved for extensions, additions and improvements and for retiring underlying bonds. This company bought the properties of the Southern Indiana and the Chicago Southern. There are about 298 miles of main line and 52 miles of branches. The bonds are a first mortgage on the line between Chicago Heights and the Indiana-Illinois state line, about 114 miles, with some equipment.

CORVALLIS & ALSEA RIVER.—A press despatch from Monroe, Ore., says that this road and the Portland, Eugene & Eastern are to be merged, and when the lines are completed they will be electrified.

DETROIT, TOLEDO & IRONTON.—Application has been made to the federal court for permission to issue \$500,000 receivers' certificates in order to meet pay rolls, repair road and bridges, etc.

ILLINOIS CENTRAL.—The New York Stock Exchange has listed \$2,740,000 additional refunding mortgage 4 per cent. bonds, due 1950. These bonds have been issued in exchange for \$78,000 St. Louis division and terminal 3½ per cent. bonds and \$2,662,000 purchased lines 3½ per cent. bonds.

INDIANA HARBOR BELT.—See Chicago, Milwaukee & St. Paul.

JONESBORO, LAKE CITY & EASTERN.—We are informed that the ownership of the capital stock of this company has changed hands and that the company has been reorganized. See the new officers under Railway Officers.

LAKE SUPERIOR & ISHPeming.—Stockholders are to vote March 30 on the question of authorizing the issue of new first mortgage bonds. The last of the first mortgage bonds of 1896 were called for payment on January 1, 1911.

LANCASTER, OXFORD & SOUTHERN.—John A Nauman has been appointed receiver of this company, which owns and operates a narrow gage line from Quarryville, Pa., to Peach Bottom. The petition for receivership is by the stockholders.

LONG ISLAND.—Holders of the \$1,000,000 Brooklyn & Montauk first mortgage 5 per cent. and 6 per cent. bonds, matured March 1, 1911, are offered the privilege of exchanging their bonds for Long Island refunding mortgage 4 per cent. bonds maturing March 1, 1949, guaranteed principal and interest by the Pennsylvania Railroad. The refunding bonds are taken at 97, and the difference of \$30 will be paid in cash at the time of exchange. Bonds that are not exchanged are redeemed in cash.

MARSHALL & EAST TEXAS.—Directors have authorized a mortgage to secure \$5,000,000 bonds, to be sold as required for extensions and improvements.

MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE.—This company has made a mortgage securing \$1,358,866 equipment trust certificates. These certificates are to be issued to pay for steel cars of various kinds.

NEW ORLEANS TERMINAL CO.—This company has sold to Lee, Higginson & Co., Boston, Mass., \$4,000,000 first mortgage 4 per cent. bonds of 1903-1953. The bonds are guaranteed principal and interest jointly and separately by the St. Louis & San Francisco and by the Southern Railway, and are part of an authorized issue of \$15,000,000, of which \$14,000,000, including this issue, are now outstanding. The bankers are offering these bonds at 88, yielding about 4.65 per cent. income.

NEW YORK CENTRAL & HUDSON RIVER.—The directors have declared a quarterly dividend of 1¼ per cent., payable April 15. In 1907 the rate was increased to 1½ per cent. quarterly; in 1908 it was reduced again to 1¼ per cent.; in March, 1910, it was increased to 1½ per cent. quarterly.

NORTHERN CENTRAL.—The Maryland court of appeals has affirmed the decision of the circuit court of Baltimore holding the lease of the Northern Central to the Pennsylvania as not redeemable under Maryland laws.

ONEIDA RAILWAY.—See West Shore.

PENNSYLVANIA RAILROAD.—For the first time the Pennsylvania Railroad and the Pennsylvania Lines West have prepared their monthly statements of operating revenues and expenses, which they distribute to interested stockholders and bankers, so as to show the total amount of operating revenues and of operating expenses and the increase or decrease, as compared with the corresponding month of the year before. The statements are made up for the various companies operating the lines west and there is also a statement showing the combined revenues and expenses for the entire system east and west. Heretofore the Pennsylvania has made monthly statements simply showing the increase or decrease from the corresponding month of the year before. See Baltimore, Chesapeake & Atlantic

PITTSBURGH, BINGHAMTON & EASTERN.—The property of this road, which was projected to run from Binghamton, N. Y., to Keating Summit, has been sold under foreclosure. It is understood that the part in Lycoming and Clinton counties was sold for \$25,000 to a subsidiary of the New York Cen-

tral & Hudson River. The remainder of the road and the grading was sold separately.

PITTSBURGH & LAKE ERIE.—The directors have voted an increase in capital stock of \$4,200,000 giving the privilege to stockholders to subscribe in the ratio of 20 per cent. of holdings at par. The directors have also declared a cash dividend of 25 per cent., payable March 31.

SOUTHWESTERN OF TEXAS.—The Railroad Commission of Texas has authorized the company to issue \$35,000 stock and \$354,905 first mortgage 5 per cent. bonds of 1907-1937, secured on the 30 miles of road in operation from Henrietta to Archer City.

ST. JOSEPH & GRAND ISLAND.—The Union Pacific offers to buy the minority holdings of stock at \$53.91 per share of first preferred, \$37.49 per share of second preferred and \$20.07 per share of common. Judge Lovett says in part:

"In view of the inquiries from time to time respecting the prospects for dividends, especially on the first preferred stock, the following is submitted:

"All the bonds issuable under the mortgage of the railway company have been issued, except \$1,000,000 reserved exclusively for the construction of additional lines of railway, and even those can be issued only at a rate of not exceeding \$6,000 per mile of new railway. The company is without other means of raising money for the additions and betterments absolutely necessary to bring the property up to the condition in which it must be maintained to secure and properly handle the traffic it should enjoy, and to buy the necessary engines and other equipment.

"Its earnings are the only source to which the company can fairly look for the money with which to meet these expenditures, at least until the condition of the property and the company's business are such as to establish for it a credit that will enable it to borrow the money at reasonable rates, notwithstanding the existing mortgage. How long this will be is uncertain. It seems plain, however, that the board of directors would not be warranted in declaring dividends at this time.

"The St. Joseph & Grand Island was for a number of years a part of the Union Pacific system, but became detached through foreclosure and reorganization proceedings. It seemed, however, that the former relations should be restored, and to that end the Union Pacific in 1906 acquired a considerable amount of the stock of the St. Joseph & Grand Island. During the fiscal year ended June 30, 1910, purchases were resumed, as shown by the published annual report of the Union Pacific for that year, and at this date it owns 58.07 per cent. of the entire capital stock. The average prices paid for all stock purchased since such purchases were resumed during the last fiscal year are as follows: For first preferred shares, \$53.91 per share; for second preferred shares, \$37.49 per share; for common shares, \$20.07 per share."

ST. LOUIS & SAN FRANCISCO.—William Salomon & Co., New York, have bought \$2,700,000 4 per cent. refunding bonds of the Kansas City, Fort Scott & Memphis of 1901. The bonds are guaranteed principal and interest by the St. Louis & San Francisco. Of the proceeds of the sale of these bonds, \$2,055,300 will be used for refunding purposes.

ST. LOUIS SOUTHWESTERN.—This company has sold to the Guaranty Trust Co. and Rhoades & Co., both of New York, \$800,000 Central Arkansas & Eastern first mortgage 5 per cent. bonds of 1910-1940, guaranteed principal and interest by the St. Louis Southwestern. These bonds are a first mortgage on the new extension under construction from Stuttgart, Ark., to Hazen, and from England to Stuttgart, a total of 45 miles. See this company under Railway Construction.

TEMISKAMING & NORTHERN ONTARIO.—The Province of Ontario is to borrow \$5,500,000, of which \$2,500,000 is to be advanced to a hydro-electric project and the remaining \$3,000,000 will be advanced to the Temiskaming & Northern Ontario.

UNION PACIFIC.—See St. Joseph & Grand Island.

WEST SHORE.—The Oneida Railway has asked the New York Public Service Commission, Second district, to approve an agreement running 475 years providing for the operation by third rail of passenger and express cars by the Oneida company over the West Shore between Utica and Syracuse.

Supply Trade Section.

There are now in service over 100,000 Willard train-lighting cells, made by the Willard Storage Battery Company, Cleveland, Ohio.

The Montreal Locomotive Works, Montreal, Que., has received orders from the Canadian Pacific for two steam shovels and from the Grand Trunk Pacific for one steam shovel.

F. H. Greene, general purchasing agent of the New York Central & Hudson River, has resigned to become president of the Hale & Kilburn Manufacturing Company, Philadelphia, Pa.

The Pay-As-You-Enter Car Corporation, New York, and the Pay-Within Car Company, Philadelphia, Pa., have been merged into one organization. The new company will be the Prepayment Car Sales Company, with office at 50 Church street, New York.

The McKeen Motor Car Company, Omaha, Neb., has received an order from the Sand Springs Interurban Railway for one 70-ft. gasoline motor car. This will make 41 railways either having these motor cars in operation or on order at the present time.

The Bowman-Blackman Machine Tool Company, St. Louis, Mo., is the successor to the firm of Albert B. Bowman, dealer in machine shop equipment. The formation of the new company is due to the entrance into the firm of G. H. Blackman. Mr. Blackman is a graduate of the mechanical engineering department of the Missouri State University, and is an experienced machine tool man. He has been with the Bowman company for several years.

The Acme universal uncoupling device, made by the Acme Railway Equipment Company, Philadelphia, Pa., is being applied to the following cars: Four hundred and fifty hopper cars and gondola cars, being built for the New York, Ontario & Western; 2,150 miscellaneous cars and 30 locomotives being built for the Pittsburg & Shawmut, 1,000 miscellaneous freight cars being built for the New York, New Haven & Hartford; and 800 box and hopper cars being built for the Lehigh & New England.

The Portland Railway, Light & Power Company, Portland, Ore., has ordered six 1,000-k.w. motor-generators sets from the General Electric Company, Schenectady, N. Y. Four of these will furnish power to the electric railway system and each will consist of a 1,060-h.p. 10,000-volt 3-phase synchronous motor connected to a 1,000-k.w. 600-volt direct current generator. The other two will furnish power for lighting and each will consist of a 1,060-h.p., 10,000-volt 3-phase synchronous motor direct connected to a 1,000-k.w. 300-volt direct current generator.

The annual report of the Railway Steel-Spring Company, New York, for the year ending December 31, 1910, shows that gross sales were \$10,035,435, an increase of \$2,192,143 over 1909. The surplus, after fixed charges, was \$810,077, or 6 per cent. on the \$13,500,000 common stock, as compared with 5.32 per cent. earned on the same stock in 1909. At the annual meeting Otis H. Cutler, president of the American Brake Shoe & Foundry Company, Mahwah, N. J., was elected a director to succeed the late Frank S. Layng. The officers of the company and the other directors were re-elected.

The annual report of the Cambria Steel Company, Johnstown, Pa., for the year ended December 31, 1910, shows that the earnings or income from operation, after all expenses incident to same (including those for ordinary repairs and maintenance) had been deducted, added to other income was \$5,461,336 in 1910, compared with \$3,329,849 in 1909. The net income was \$4,553,332 in 1910, compared with \$2,538,087 in 1909. The dividends paid out in 1910 were \$2,250,000 compared with \$1,800,000 in 1909. The balance carried to profit and loss was \$113,294 in 1910, compared with \$38,087 in 1909.

The Chicago Pneumatic Tool Company, Chicago, as mentioned in our issue of January 20, has acquired from the Duntley Manufacturing Company, Chicago, the right to make and sell the Rockford gasoline motor cars. The manufacture will be conducted on a large scale and workmanship and material will be maintained at the same standard that the company insists on

for its pneumatic tool products. All parts will be made to jig and templet, insuring interchangeability and thereby facilitating repairs. The frames will be entirely of welded steel and a number of other improvements are being made which have been suggested by the experience gained in the operation of some 800 cars in actual service. There are at present cars of the Rockford type in use on 132 railways, all of which have been put in service during the last two years.

The Kennicott Company, Chicago Heights, Ill., announces that to provide adequate facilities for its steel car department an extensive addition is being made to its plant and the most modern machinery and appliances are being installed to economically handle heavy steel work. The car department is one of the newer lines of the Kennicott company, and is becoming a very important part of its business. The department is prepared to handle structural steel freight and passenger equipment, steel underframes for all classes of equipment, steel tank cars complete, steel re-enforcers or strengtheners for wooden equipment, trucks and mine cars and general plate construction. An order has just been taken for 10 steel box car underframes for the Erie; and 250 steel twin hopper underframe and six steel postal car underframes have just been completed for the same company.

The Consolidated Concrete Tie Company, Cairo, Ill., has been organized to make and sell concrete ties under the Sneed and Cowan patents. The capital stock is \$100,000, and is fully subscribed. The officers of the company are: J. R. Sneed, president; A. E. Reader, first vice-president; D. W. Heilig, second vice-president; H. B. Eshleman, secretary and treasurer; R. J. D. Cowan, general manager. The Sneed patent covers a one-piece tie of reinforced concrete with wood or paper cushions to take the shock of the rolling stock. The Cowan patent covers a three-piece reinforced concrete tie which also uses wood or paper cushions as above. The company is at present making the one-piece type and test ties are being placed in a number of stretches of track on various railways. The Illinois Central has had 12 of these ties in service in a side track at Dongola, Ill., since October 15, 1910. Up to the present the ties have shown no signs of deterioration.

Frank H. Greene, general purchasing agent of the New York Central Lines, has resigned to become president of the Hale & Kilburn Manufacturing Company, Philadelphia, Pa. Mr. Greene

was born on April 3, 1868. At the age of 17 he entered the railway service as clerk in the purchasing department of the Grand Trunk. Since then he has been, consecutively, chief clerk in the general stores department of the Chicago & North Western; secretary to the superintendent of motive power of the same road; and traveling auditor in charge of material and supplies for the same road. In July, 1899, he was made secretary to the superintendent of motive power of the Lake Shore & Michigan Southern. From January, 1900, until January, 1906, he was purchasing

agent of the Lake Shore & Michigan Southern, the Lake Erie & Western and the Indiana, Illinois & Iowa, with office at Cleveland, Ohio. On January 1, 1906, Mr. Greene came to New York to fill the position which he has just resigned. Mr. Greene is a member of the Engineers Club, the New York Railroad Club and the Western Railway Club.



Frank H. Greene.

TRADE PUBLICATIONS.

Georgia, Florida & Alabama.—The traffic department of the Georgia, Florida & Alabama has published a booklet describing the communities along its line that offer special agricultural and commercial opportunities.

Ingot Iron.—The American Rolling Mill Co., Middletown, Ohio, has published a 35-page booklet on American ingot iron, giving results of tests, a list of articles made of this metal and tables of dimensions and prices.

Southern Pacific.—This company has published exceptionally attractive booklets on the Walla Walla Valley, Wash.; on Eugene, Ore.; on Salem, and on Oregon City. The opportunities, resources and industries are so illustrated and described that from a hasty glance one can get a good idea of what these regions offer.

Motors.—The Crocker-Wheeler Co., Ampere, N. J., has published Bulletin No. 126 on polyphase induction motors. These motors vary from $\frac{1}{2}$ h. p. to 250 h. p. and can be applied to nearly all forms of industrial machinery. This booklet describes these motors and gives illustrations of the interiors of some industrial plants in which they have been installed.

Storage Batteries.—The Willard Storage Battery Co., Cleveland, Ohio, has devoted Bulletin No. 34 to Willard storage batteries. Descriptions and illustrations of the stationary types for use in railway signaling and tables of dimensions and prices are included. Bulletin No. 29 is a folder describing the construction and qualities of the Willard standard plates for signal service.

Locomotives.—The Hannoversche Maschinenbau-Actien-Gesellschaft, Hannover-Linden, Germany, has published folders No. 1003, 1005 and 1007, giving the principal dimensions and gross ton loads for different gradients for 45-ton switching locomotives, 67-ton consolidation locomotives and 74-ton double-ender tank locomotives, respectively. The data in these folders is printed in different languages, including English, and valuable conversion tables are given on the back of each.

Car Ventilators.—Burton W. Mudge & Company, Chicago, are distributing a handsomely illustrated booklet covering the special features of their Garland system of ventilation for passenger coaches, street cars and freight equipment. The illustrations show in the best way possible the application and advantages of this system. Drawings are also included to illustrate the suction effect which is produced by the moving car and which is a feature in this ventilating system.

RAILWAY STRUCTURES.

ATLANTA, GA.—The Southern Railway has given a contract to R. W. Walker, Atlanta, for putting up a three-story freight house and a six-story office building on Madison avenue, in Atlanta. The freight house is to be built of reinforced concrete, and the office building is to have a reinforced concrete frame with pressed brick face. The buildings will be 50 ft. wide, and together will have a total length of 740 ft.

AUGUSTA, ME.—The governor has signed a bill allowing the closing of Court street in Augusta. This will permit the Maine Central to build a new passenger station on the site selected.

BROOKLYN, N. Y.—The Coney Island & Brooklyn is planning to spend \$100,000 for a new terminal, on Surf avenue, Coney Island.

CALGARY, ALB.—Bids are wanted until March 22 by the division engineer of the Canadian Pacific, at Calgary, for 26 section houses, five stations and freight sheds, three stations, two bunk houses and two 6-stall roundhouses, to be built in Alberta and Saskatchewan.

CHIMNEY ROCK, N. C.—See Isothermal Traction under Railway Construction.

EAGLE LAKE, TEXAS.—The Gulf, Colorado & Santa Fe has let the contract for building a new combined passenger and freight station at Eagle Pass to cost between \$8,000 and \$10,000.

EVERETT, WASH.—The Great Northern is having plans made for a new station at Everett, to cost \$500,000. (January 20, p. 147.)

GREAT FALLS, MONT.—The Great Northern, it is said, is planning to put up a freight house at Great Falls, to cost \$80,000.

HASTINGS, MINN.—See St. Paul Southern (Electric) under Railway Construction.

LEBANON, PA.—The Hummelstown & Campbellstown Railway is planning to put up a car barn and power plant in Lebanon.

LOS ANGELES, CAL.—The Southern Pacific, according to statements of President Lovett, is to build a new passenger station on the site of its present station. Negotiations for building a union station have not met with the favor of the railways interested, and it is not likely that an agreement can be reached.

MARQUETTE, MICH.—The Lake Superior & Ishpeming has let the contract for its No. 2 ore dock. The dock will be of steel and concrete construction, and it is estimated to cost \$1,250,000.

MEDICINE HAT, ALB.—It is understood that the Canadian Pacific will make improvements at Medicine Hat, to include a double-track steel bridge to cost \$314,000.

MONTREAL, QUE.—An officer of the Canadian Northern is quoted as saying that the company has definitely decided to enter the center of Montreal. It is the intention of the company to build a large terminal instead of continuing to use the old Moreau street terminal on the outskirts of the city.

NEBRASKA CITY, NEB.—The Missouri Pacific has agreed to an ordinance that was passed by the city council some time ago granting the right to the Chicago, Burlington & Quincy to close South Sixth street in order to build a passenger station and a subway. The Missouri Pacific is interested in this subway on account of the fact that it will carry the Burlington under a portion of the Missouri Pacific right of way.

NEW HAVEN, CONN.—According to press reports, the New York, New Haven & Hartford will make extensive improvements at New Haven, in connection with the new roundhouse and machine shop plant on the Quinnipiac meadows.

NEW LONDON, CONN.—According to press reports, a new railway bridge is to be built over the Thames river at a point 400 ft. north of the present structure, for which plans have been made. It is expected that the work will be started during 1911.

NEW YORK.—The Board of Estimate has approved the spending of \$605,742 for strengthening the end spans of the Williamsburg bridge over the East river, to permit the operation of subway trains over the structure.

OAKLAND, CAL.—The Southern Pacific has filed a building contract for improvements to its pier at Oakland, to cost \$14,700.

PORTLAND, ME.—The Portland Union Railway Station Co. proposes to change its name to the Portland Terminal Company, and to eliminate grade crossings in the cities of Portland, South Portland and Westbrook.

SOUTH BEND, IND.—A bill authorizing the elevation of railway tracks in South Bend has passed both houses of the state legislature.

SPOKANE, WASH.—The North Coast is said to have given a contract for building a bridge over the Spokane river.

ST. LOUIS, MO.—The St. Louis Southwestern has bought land in the heart of the terminal district of St. Louis at a cost of about \$1,250,000. This land will be used for freight yards and a freight station when plans now under way have been completed. The property covers three blocks and measures about 900 ft. by 275 ft., situated directly between the freight terminals of the Pennsylvania Railroad and the Burlington. Tracks of the Terminal Railroad Association of St. Louis, in which the St. Louis Southwestern holds an equal interest with fourteen other lines, run on both sides of the property. This will make the facilities offered by the new location unsurpassed. Increase in the Cotton Belt's traffic in and out of St. Louis made these arrangements necessary.

SYDNEY, N. S.—The Intercolonial station was damaged by fire recently, with an estimated loss of about \$60,000.

VANCOUVER, B. C.—The Great Northern will put up a new freight house, it is said, at Vancouver.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Pere Marquette is said to be making inquiries on 50 locomotives.

The Kansas City Southern is said to be making inquiries on 20 locomotives.

The San Antonio & Aransas Pass is in the market for 4 mogul locomotives.

The Atlantic Coast Line has ordered 29 locomotives from the Baldwin Locomotive Works.

The Western Maryland is in the market for 30 consolidation locomotives, 5 Mallets and 5 Pacific type locomotives.

The Pan American of Uruguay is said to have ordered 8 locomotives from the Lima Locomotive & Machine Company.

The Laurinburg & Southern has ordered one 10-wheel locomotive from the Baldwin Locomotive Works. The dimensions of the cylinders will be 18 in. x 26 in., and the diameter of the driving wheels will be 56 in.

The Louisville, Henderson & St. Louis has ordered 1 six-wheel switching locomotive from the Baldwin Locomotive Works. The dimensions of the cylinders will be 20 in. x 26 in., and the total weight in working order will be 132,000 lbs.

The Illinois Central, reported in the *Railway Age Gazette* of January 20 as being in the market for 5 Pacific type locomotives, 20 consolidation locomotives and 20 mikado locomotives, has ordered 40 mikado locomotives from the Baldwin Locomotive Works.

The Delaware, Lackawanna & Western has ordered 35 locomotives from the American Locomotive Company. This order includes 15 consolidation locomotives, 7 mogul locomotives, 7 six-wheel switching locomotives and 6 eight-wheel passenger locomotives.

The Crystal City & Uvalde has ordered one mogul locomotive from the American Locomotive Company. The dimensions of the cylinders will be 18 in. x 24 in., the diameter of the driving wheels will be 54 in., and the total weight in working order will be 120,000 lbs.

The Spokane, Portland & Seattle has ordered 2 ten-wheel locomotives from the Baldwin Locomotive Works. The cylinders of these locomotives will be 22 in. x 26 in., the diameter of the driving wheels will be 72 in., and the total weight in working order will be 160,000 lbs.

The Nova Scotia Steel & Coal Company, New Glasgow, N. S., has ordered one six-wheel switching locomotive from the Montreal Locomotive Works. The dimensions of the cylinders will be 19 in. x 26 in., the diameter of the driving wheels 50 in., and the total weight in working order 124,000 lbs.

Corrigan, McKinney & Company, Cleveland, Ohio, have ordered 2 six-wheel switching locomotives from the American Locomotive Company. The dimensions of the cylinders will be 19 in. x 26 in., the diameter of the driving wheels will be 50 in., and the total weight in working order will be 123,000 lbs.

CAR BUILDING.

The Montreal Street Railway is in the market for 50 pay-as-you-enter cars.

The Chicago, Rock Island & Pacific is said to be making inquiries on 1,450 freight cars.

The Baltimore & Ohio is said to have ordered 1,000 box cars from the American Car & Foundry Company.

The New York, Ontario & Western will be in the market shortly for 350 coal cars and 100 gondola cars.

The Birmingham Southern is in the market for 55 gondola cars, 20 flat cars and 25 steel underframe box cars.

The Nashville, Chattanooga & St. Louis has placed with the American Car & Foundry Company an additional order for 100 box cars.

The Boston Elevated has ordered 40 subway cars from the Standard Steel Car Company and 20 coaches from the Pressed Steel Car Company.

The New York Central Lines have ordered 25 all-steel postal cars from the American Car & Foundry Company and 25 all-steel postal cars from the Pressed Steel Car Company.

The Algoma Central & Hudson Bay has ordered 175 forty-ton steel underframe flat cars from the Canadian Car & Foundry Company and 50 fifty-ton ore cars from the Hart-Otis Car Company.

The Illinois Central has authorized the building of 500 forty-foot thirty-ton steel underframe refrigerator cars at its shops at Burnside, Ill. The cars will be equipped with Bettendorf underframes and trucks.

The Ann Arbor, mentioned in the *Railway Age Gazette* of February 17 as being in the market for 110 freight cars, has ordered 50 steel underframe box cars and 60 refrigerator cars from the Standard Steel Car Company.

The Chicago, Indianapolis & Louisville, mentioned in the *Railway Age Gazette* of January 27 as being in the market for 400 freight cars, has ordered 200 forty-ton flat cars and 100 forty-ton automobile cars from the Haskell & Barker Car Company.

The Delaware, Lackawanna & Western, mentioned in the *Railway Age Gazette* of February 17 as being in the market for 12 milk cars, has ordered this equipment from the American Car & Foundry Company, and is now in the market for 3 combination smoking and first-class coaches.

The Richmond, Fredericksburg & Potomac, mentioned in the *Railway Age Gazette* of February 24 as being in the market for 50 box cars and 50 flat cars, has ordered 50 steel underframe box cars from the Standard Steel Car Company. Orders for the 50 flat cars will be placed in the near future.

The Wabash-Pittsburg Terminal, mentioned in the *Railway Age Gazette* of February 10 as being in the market for 1,000 coal cars, has ordered 500 steel hopper cars from the Pressed Steel Car Company and 500 steel hopper cars from the Standard Steel Car Company.

The Lehigh & New England, as reported in the *Railway Age Gazette* of February 24 has ordered 500 all steel hopper cars from the Cambria Steel Company and 300 steel underframe box cars from the American Car & Foundry Company. The hopper cars will be built at Johnstown, Pa. Their capacity will be 50 tons and they will weigh 34,000 lbs. The inside measurements will be 30 ft. long, 9 ft. 5½ in. wide and 6 ft. 10½ in. high. The over-all measurements will be 31 ft. 6 in. long, 9 ft. 11½ in. wide and 10 ft. high. The box cars will be built at Berwick, Pa. Their capacity will be 30 tons and they will weigh 34,000 lbs. The inside measurements will be 36 ft. long, 8 ft. 6 in. wide and 7 ft. 9¼ in. high. The over-all measurements will be 37 ft. long, 9 ft. 4¾ in. wide and 13 ft. 7 in. high. The special equipment on both types will be identical except where indicated.

Bolsters, truck....	Gould.
Brakebeams	Davis solid truss.
Brakeshoes	Am. Brake Shoe & Fdy. Co.
Brakes	Westinghouse.
Couplers	Gould.
Draft-rigging	Farlow on hopper cars.
Draft-rigging	Miner twin spring.
Journal bearings	Ajax.
Journal boxes	Gould on 250 hopper cars and on box cars.
Journal boxes	Symington on 150 hopper cars.
Journal boxes	Union Spring & Mfg. Co. on 100 hopper cars.
Paint	Dixon's silica-graphite on hopper cars.
Paint	Nobrac on box car underframes.
Paint	Metallic brown on box car bodies.
Springs	Union Spring & Mfg. Co.
Wheels	National Car Wheel Co. on hopper cars.

IRON AND STEEL.

The Harriman Lines will place orders for 150,000 tons of rails shortly.

The Havana Central is 1,000 tons of 45-lb. rails and 200 tons of 70-lb. rails.

The Pan-American of Uruguay is in the market for about 40,000 tons of rails.

The Atlantic Coast Line has ordered 1,600 tons of rails from the Carnegie Steel Company.

The Chesapeake & Ohio has ordered 2,000 tons of rails from the Carnegie Steel Company.

The Manila Railways have ordered 10,000 tons of rails from the Lackawanna Steel Company.

The Lake Shore & Michigan Southern is in the market for 1,700 to 1,800 tons of structural steel.

The Pennsylvania Lines West are in the market for 2,000 tons of structural steel for grade crossings.

The Cleveland, Akron & Columbus has ordered 10,000 tons of rails from the Carnegie Steel Company.

The Georgia Coast & Piedmont has ordered 1,500 tons of structural steel from the Virginia Bridge & Iron Company.

The Delaware & Hudson has ordered 4,000 tons of structural steel from the McClintic-Marshall Construction Company for use in its shops at Watervliet, N. Y.

The Transcontinental (for eastern section of Grand Trunk Pacific) has ordered 61,000 tons of rails. The Algoma mills will roll 35,000 tons and the remaining 26,000 tons will be furnished by the Dominion Iron & Steel Company.

The Canadian Pacific, mentioned in the *Railway Age Gazette* of February 24 as being in the market for 100,000 tons of rails, has placed this order with the Lake Superior Iron & Steel Company and the Dominion Iron & Steel Company. This road is still in the market for 20,000 tons of rails.

General Conditions in Steel.—The new orders of the United States Steel Corporation during February averaged 40,775 tons a day, the largest reported since early last year. This is an increase of 18 per cent. over the January average. The true conditions in the industry, however, cannot be ascertained until after the period of suspense is over regarding the Oil and Tobacco decisions and the tariff revision. The orders now on the books are sufficient to warrant average operations of about 75 per cent. through March and April, and it is generally believed that daily orders in March will even exceed those of February.

MACHINERY AND TOOLS.

The Carolina & Northwestern is in the market for a number of machine tools.

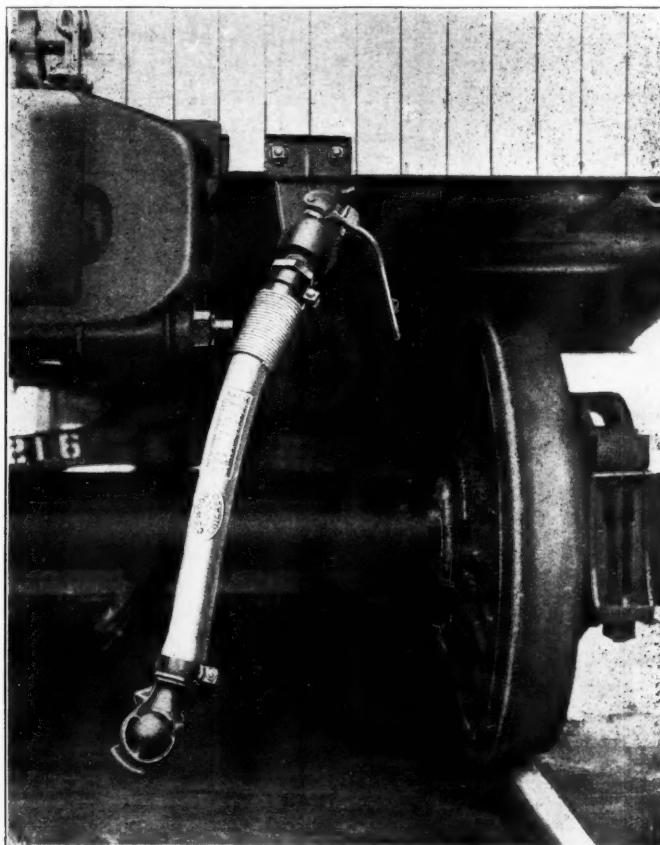
The Illinois Central has authorized the purchase of a list of machine tools to cost about \$30,000. The following machines are included in the list, upon which prices are now being received: One 600-ton wheel press, two 2-in. bolt cutters, two 2-in. pipe cutters, one 72-in. radial drill, one 48-in. milling machine, one cold saw, one 1½-in. bolt header, one 36-in. by 12-ft. engine lathe, one 24-in. by 10-ft. engine lathe, four 20-in. by 8-ft. engine lathe and one 30-in. by 12-ft. engine lathe, one crank shaper, one 10,000-lb. hoist, one air compressor and a set of straightening rolls for steel car work.

Bracket for Brake Angle Cock.

The M. C. B. standard for air brake train pipes, adopted in 1904, specifies that the hose angle cock threaded to the end of the train pipe should be located 13 in. from the center line of the coupler, and 13 in. from the face line of the knuckle, and that the angle cock should be set at an angle of 30 deg. On an inspection trip made recently through the switching yards and terminals at Chicago, on nearly 70 per cent. of the cars examined the angle cocks were not in the required position, and the train line pipes were loose and easily shifted on account of insecure fastenings. The appliances in general use are made of two pipes of wrought iron bolted together and clamped around the train pipe, but these are not effective enough to hold the pipes rigid in the proper position, and no provision is made to insure the angle cock being held at the proper angle.

The Monogram bracket, here illustrated, will overcome these derangements, and thereby eliminate train pipe repairs due to broken and leaky joints, caused by the movement of the train pipe through the brackets now in general use. It will positively lock and hold the angle cock in a 30 deg. position, thus reducing the loss of the angle cock and hose on account of the break-

ing of the nipple. The maintenance of the 30 deg. angle is important, as it results in the brake hose being held in the position most favorable for coupling and uncoupling, and prevents kinks in the hose which interfere with the free passage of air through it. The Monogram bracket has been in successful use for sev-



Wood's "Monogram" Bracket for Brake Angle Cock.

eral years, and has so demonstrated the advantage above described that it has recently been applied to a large number of cars for several large railways. It is manufactured and sold by Guilford S. Wood, Great Northern building, Chicago.

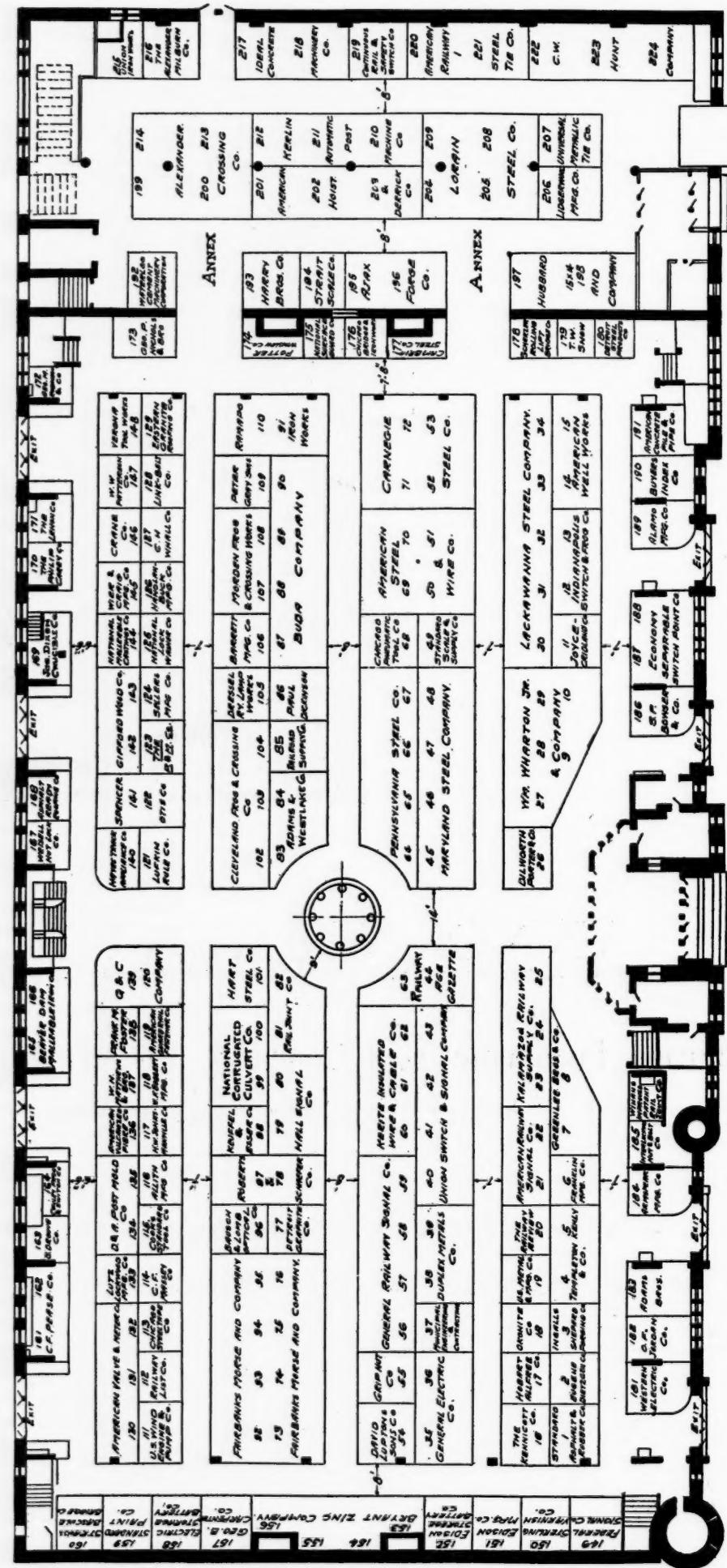
Railway Appliances Association.

Final preparations are being made for the exhibition of railway appliances to be held in the Coliseum, Chicago, during the convention of the American Railway Engineering and Maintenance of Way Association. The exhibition last year was so great a success that a resolution was passed by the Maintenance of Way Association recognizing its high merit, and commanding the Railway Appliances Association for its efforts. The number of engineers attending the exhibition was large, and plans are being made to care for an equal number this year. Free automobile service will be provided for all delegates from the Congress Hotel to the Coliseum, making it easy to reach the exhibit whenever spare time is available.

The musical program at the Coliseum this year will be furnished by the Ellis Brooks' Band, which will give a popular program each afternoon and evening.

The feature of greatest interest to many will no doubt be the monorail car, which is to be in daily operation at the south end of the balcony. It has been arranged to present this model car to one of the engineering universities for a permanent exhibit. The university which is to be so favored will be determined by vote of the railway officials attending the exhibition.

The exhibit this year will be larger and better than any previous one. A total of 49,211 sq. ft. of floor space will be occupied by exhibitors. This includes the entire main floor, the entire annex and practically the entire balcony. A few good spaces are still available on the balcony, which may be secured by application to John N. Reynolds, secretary, 303 Dearborn street, Chicago. See floor plan on following page.



Plan of the Main Floor of the Coliseum, Chicago.